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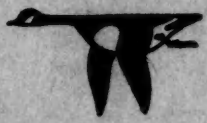
WILDLIFE REVIEW



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UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

WILDLIFE REVIEW

An abstracting service for wildlife management
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by the Fish and Wildlife Service
United States Department of the Interior

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Except as indicated, abstracts are by William H. Stickel, editor.

WILDLIFE--NEW STATE GAME JOURNAL

ARIZONA GAME AND FISH DEPARTMENT WILDLIFE NEWS. Published quarterly by Arizona Department of Game and Fish, Arizona State Building, Phoenix. Vol. 1, no. 1, 8 p., illus., processed, June 1954.
First issue contained harvest data and hunting statistics for dove, turkey, elk, and deer; information on introduction of brown francolin; departmental news; other news notes; and a photo story.

WILDLIFE--BIBLIOGRAPHY, BIOGRAPHY, HISTORY

Author? AGENCIES OF THE FEDERAL GOVERNMENT CONCERNED WITH RECREATION. National Recreation Association, 315 Fourth Ave., N. Y. 10, N. Y. [1954?] $1.00. [From Journal of Forestry 52 (6).]
"...this is a reference that lists those federal agencies controlling recreational areas and those that are service agencies in recreation. With a brief discussion of the function of each, including trends, inadequacies and needs."

Underwood, Margaret Hanselman. BIBLIOGRAPHY OF NORTH AMERICAN MINOR NATURAL HISTORY SERIALS IN THE UNIVERSITY OF MICHIGAN LIBRARIES. University of Michigan Press. [5] + 1-197 p. 1954. $1.75. [From review by J. T. Zimmer, Auk 71 (3).]
Much significant work has been published in little-known or short-lived natural history journals. "Mrs. Underwood has assembled a list of all such journals as are preserved in the University of Michigan libraries, either complete or fragmentary, and has unearthed a great deal of information about them--changes of title or format, pagination, frequency and dates of publication, editorship, and other such details. In addition, various collaborators have supplied annotations regarding the importance or content of the journals, their most noteworthy contributors, and often the titles of their contributions... There is no comparable publication..."

Various authors. FREDERIC EDWARD CLEMENTS (1874-1945). Ecology 35 (2): 109-116, illus. April 1954.
Set of 4 short papers honoring one of the leading founders of plant ecology. They contain much information on his life and work and one includes a selected bibliography. Authors are Raymond J. Pool, Roscoe Pound, John Phillips, and Vernon A. Young.

Wiley, Farida A., editor. ERNEST THOMPSON SETON'S AMERICA. Devin-Adair Co., N. Y. 413 p., illus. 1953. $5.00. [From review by F. P. Cronemiller, Journal of Range Management 7 (4).]
Contains a diversified selection of Seton's writings, both fiction and non-fiction, and a number of his drawings. "The editor has assembled not only samples of the best of Seton's work but also biographical material, the techniques he developed, his artistry and some fine bits of philosophy." The "excellent biography...is made increasingly intimate through notes by Mrs. Julia M. Seton on his life and work. There is a table of contents, a carefully prepared index and a list of sources, of each of the stories."

WILDLIFE--EDUCATION

Dolder, Edward F. (Calif. Dept. Nat. Resources.) CONSERVATION EDUCATION. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm'rs., June 1-3, 1953. p. 270-275. [1954.]
Objectives of the Calif. program and how they are implemented.

Hanlon, Robert W. (High School, Mankato, Minn.) DEVELOPING INTEREST IN HIGH SCHOOL BIOLOGY. Conservation Volunteer 17 (99): 35-41, illus. May-June 1954. Reprinted from March 1954 issue of Minnesota Naturalist.
This article brought the author an award "for promoting student interest in natural history or conservation." Basically, the system consists of getting students active on a wide range of natural history, conservation, and prepara-

WILDLIFE--EDUCATION--Continued

torial projects. Collection, preparation, and study of specimens or portions of them are part of the work, but so are studies of duck and pheasant hunting results, small mammal trapping projects, and many other activities in which students actively participate.

Lahr, Leslie E. (Calif. Dept. Game.) FISH AND GAME EMPLOYEE RELATIONS. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm'rs., June 1-3, 1953. p. 276-279. [1954.]
Describes the in-service training program in Calif., including that for unpaid reserve wardens. Stresses importance of all members of staff, especially wardens and other field men, being thoroughly informed on departmental policies and actions, and importance of all employees practicing good public relations.

Leedy, Daniel L. (US F&WS.) WILDLIFE TRAINING AND EMPLOYMENT. U. S. Fish & Wildlife Service, Wildlife Leaflet 352. 1-10 p. June 1954.
Discusses types of training needed in different sorts of wildlife work, outlines fields in which wildlife workers may gain employment, and lists 53 North American schools in which wildlife training is offered. Nineteen references.

Mulch, Ernest E. (Ariz. Game Comm.) COLOR SLIDES VERSUS MOTION PICTURES AS AN AID IN WILDLIFE INFORMATION AND EDUCATION PROGRAMS. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm'rs., June 1-3, 1953. p. 280-284. [1954.]
Amateurish films are no longer tolerated. A good color film costs about one hundred times as much as a good series of color slides. A slide talk presented by a representative of the agency is more effective than a film, because of the person-to-person aspect. This is true in dealing with adult groups, whether sportsmen or general public. Slide talks do require assignment of a competent man to deliver them but it is thoroughly justified to require biologists and other technicians to perform this service occasionally. Although color slides are definitely more effective in general, films have their place. It is wise to save up money and produce one high-grade film every few years, and to purchase others to supplement the slide program. In dealing with children, the author finds that basic films usually are far more effective than slides.

Ortgiesen, Leroy. THE RELATIVE EFFECTIVENESS OF SELECTED FILMSTRIPS AND SOUND MOTION PICTURES IN TEACHING SOIL CONSERVATION IN NINTH GRADE SOCIAL STUDIES CLASSES. Ph.D. thesis, U. Nebraska. 180 p. 1954. [From long abstract in Dissertation Abstracts 14 (4).]
"Educational filmstrips are more effective than sound motion pictures, and each is more effective than the regular classroom use of printed materials... The use of selected filmstrips or sound motion pictures does not adversely affect the quantity of reading reported..."

Wildlife Society Employment Committee. WILDLIFE STUDENTS, GRADUATES AND EMPLOYMENT TRENDS. Journal of Wildlife Management 18 (3): 381-388. July 1954.

WILDLIFE--TECHNIQUES

Launchbaugh, John L. (U. Calif., Berkeley.) A SIMPLE PULLER FOR SOIL TUBES. Journal of Range Management 7 (4): 182, illus. July 1954.
Extractor based on automobile bumper jack.

McCartney, Eugene S. RECURRENT MALADIES IN SCHOLARLY WRITING. University of Michigan Press. xiii + 141 p., cartoons. 1953. $2.50.
A veteran editor of technical papers discusses many common mistakes of authors. Style of his book is leisurely and literary. Touches of wit and numerous examples enliven the discourse. Chapter headings are: The studied avoidance of simplicity. "Doth not the ear try words?" Illogicality. Saying it with flowers. Some participles I have met. Oddities in measuring and counting. "Such rackers of orthography." The tautological phrase of specification. Is scholarship always scholarly? Works on scholarly writing.

WILDLIFE--TECHNIQUES--Continued

Robins, C. Richard, and Ronald W. Crawford. (Dept. Cons., Cornell U.) A SHORT ACCURATE METHOD FOR ESTIMATING THE VOLUME OF STREAM FLOW. Journal of Wildlife Management 18 (3): 366-369. July 1954.

WILDLIFE--BIOMETRICS

Bross, Irwin. (Cornell U. Med. Coll.) A CONFIDENCE INTERVAL FOR A PERCENTAGE INCREASE. Biometrics 10 (2): 245-250. June 1954.
A contribution to a subject much discussed in the wildlife field.--Vincent Schultz.

Chapman, Douglas G. (Univ. of Wash.) THE ESTIMATION OF BIOLOGICAL POPULATIONS. Annals of Mathematical Statistics 25 (1): 1-15. March 1954.
Author's summary: "A number of statistical models, underlying the methods used in the estimation of the sizes and other parameters of animal populations, are set up. The relevant estimation equations are given, with their variances and covariances. For the most part the theory is designed for large populations. In setting up the models, consideration has been given to the desideratum of having them conform as closely as possible to the actual practices of animal sampling. To what extent the models do agree with reality is one of the many open questions which are noted in this paper."--Vincent Schultz.

Hubbs, Carl L., and Clark Hubbs. (Scripps Inst., La Jolla, Calif.) AN IMPROVED GRAPHICAL ANALYSIS AND COMPARISON OF SERIES OF SAMPLES. Systematic Zoology 2 (2): 49-56, 92, graphs. 1953.

McIntosh, William Baxter. AN EVALUATION OF THE APPLICABILITY OF COVARIANCE ANALYSIS AS APPLIED TO THE COMPARISON OF BODY AND SKELETAL MEASUREMENTS BETWEEN TWO RACES OF THE DEER-MOUSE, PEROMYSCUS MANICULATUS. Ph.D. thesis, U. Michigan. 153 p. 1954. [From abstract in Dissertation Abstracts 14 (4).]

Petrides, George A. (Mich. St. Coll.) ESTIMATING THE PERCENTAGE KILL IN RINGNECKED PHEASANTS AND OTHER GAME SPECIES. Journal of Wildlife Management 18 (3): 294-297. July 1954.
Summary: "Formulas and a table are presented which permit the ready estimation of the percentage kill of male game animals where that sex is hunted discriminately and where sex ratios before and after the hunting season are known or can be estimated. Formulas also permit estimations of the percentage kill of females and of both sexes."

Schultz, Vincent. (Va. Polytechnic Inst.) WILDLIFE SURVEYS - A DISCUSSION OF A SAMPLING PROCEDURE AND A SURVEY DESIGN. M.S. thesis in statistics. Virginia Polytechnic Institute. 166 p. June 1954.
This manuscript deals with a modern sampling design and survey procedure that has been tested on an extensive wildlife survey, the Statewide Wildlife Survey of Tenn. An attempt has been made to make the manuscript a manual of procedure for future surveys. Information is presented on: (1) methods of collecting information, (2) selection and training of field personnel, (3) general field procedures, (4) questionnaires and field forms, (5) analysis, (6) preparation of final report, and (7) selected results of the Tenn. Survey.--V. Schultz.

Shanks, Royal E. (U. Tenn.) PLOTLESS SAMPLING TRIALS IN APPALACHIAN FOREST TYPES. Ecology 35 (2): 237-244, graphs. April 1954.
Critical, statistical comparison of plotless methods of sampling forest stands. Choice of method depends on aim of study.

Tanaka, Hideo, Masuo Ikuzawa, and Hiroshi Sugiyama. (Osaka City Medical School, Japan.) SOME METHODS OF ESTIMATING THE POPULATION SIZE OF RATS OR VOLES LIVING IN A SPECIFIED AREA. Journal of Osaka City Medical Center 3 (1): 1-13, graphs. 1953.
In English. A statistical paper that present 3 methods of estimating size from sequential mark-and-release data. "Among these, the graphical one, fitting linear regression, seems to be the most convenient and effective for the practical purposes."

WILDLIFE--BIOMETRICS--Continued

Tanaka, Ryo. (Kochi Women's Coll., Kochi City, Shikoku, Japan.) A REVISED METHOD FOR ESTIMATING REDUCTION OF NATURAL POPULATIONS EFFECTED BY POISONING. Special number of Japanese Journal of Sanitary Zoology vol. 4: 186-193, graph. March 1954.

In English. A statistical paper with examples from Microtus field studies. A previous paper by Tanaka (see WR 73, p. 31, second 1952 entry for Tanaka) and criticisms of it by H. Tanaka et al. (see above) are discussed. It is concluded that an equation proposed by Hayne (1949. See WR 60, p. 23.) is most suitable for practical work. Adaptation of this formula to poisoning work is discussed and an example is given. A method of determining effectiveness of poisoning operations by study of bait consumption is also presented.--L. F. Stickel.

Wadley, F. M. (3215 N. Albemarle St., Arlington, Va.) LIMITATIONS OF THE "ZERO METHOD" OF POPULATION COUNTS. Science 119 (3098): 689-690. May 15, 1954.

Wohlschlag, Donald E. (Stanford U.) MORTALITY RATES OF WHITEFISH IN AN ARCTIC LAKE. Ecology 35 (3): 388-396. July 1954.

Mortality rates were determined by mark-and-recapture methods described by Leslie and Chitty (see WR 67 p. 5, 73 p. 6, and 75 p. 8) and Bailey (see WR 69 p. 5). "The application of these techniques is discussed in detail and it is concluded that they are feasible if sampling can be carried out on a sufficiently large scale, particularly in conjunction with other studies involving mark-and-recapture operations."

WILDLIFE--ECONOMIC AND OTHER VALUES

Author? ECONOMIC VALUES. Sport Fishing Institute Bulletin no. 32. p. 5. July 1954.

"According to a survey made for the Idaho fish and game department, hunting and fishing activities in the state last year were worth $43,300,000 in sportsman expenditures. The average Idaho sportsman spent $160 in pursuit of his recreation. Twenty-four percent was for travel; food and lodging made up fourteen percent of the costs." Copied completely.

WILDLIFE--NATURAL AREAS AND REFUGES

Branch of Wildlife Refuges. 1954 ADDRESS LIST OF REFUGE MANAGERS. U. S. Fish and Wildlife Service, Leaflet WL 299. 1-8 p. Revised March 1954.

Those federal refuges that have personnel assigned to them are listed by state, and name and address of manager is given for each.

Curtis, J. T. (U. Wis.) SCIENTIFIC AREAS IN WISCONSIN. Wisconsin Conservation Bulletin 19 (5): 12-16, illus. May 1954.

"Our few remaining areas of original landscape are rapidly disappearing... The task of saving at least remnants of them for study and enjoyment is an urgent one... The 1951 Legislature created the State Board for Preservation of Scientific Areas... The purpose of such scientific areas was threefold: they are necessary for scientific research, for the teaching of conservation, and for the preservation of rare or valuable plants and animals and whole communities for future generations... In some regions, we have realized too late that our future advances in some field sciences depend upon the very existence of suitable 'fields' which can be studied!" The Board does not own areas. It investigates, advises, and lists. Lists are published biennially. The present paper lists the 16 areas now preserved, stating location, size (all small), type, ownership, and administration. These areas are largely prairie remnants, hardwood and conifer woods. Many other kinds of habitats in the state remain to be preserved. "Actually, some of these areas could serve 'double duty'. The pine barrens area could perhaps be made to coincide with a sharp-tailed grouse range, while certain of the other areas could also aid in the preservation of rare or interesting animal species."

WILDLIFE--NATURAL AREAS AND REFUGES--Continued

Gilligan, James Pershing. THE DEVELOPMENT OF POLICY AND ADMINISTRATION OF FOREST SERVICE PRIMITIVE AND WILDERNESS AREAS IN THE WESTERN UNITED STATES. Ph.D. thesis, U. Michigan. 625 p. 1954. [From long abstract in Dissertation Abstracts 14 (4).]

The author feels that wilderness areas can be preserved only as long as local economic pressures do not force their development. Reservation policy is so flexible that it can be changed by administrative decision. The policy has been largely frustrated by lack of authority over various resources within wilderness areas, and by antagonism of certain administrators. "National forest wilderness area policy and regulations have not been sufficiently strong to override fundamental policies of land management primarily concerned with local economies. As a result, many of the original western wilderness areas have been shrunk in size, until they now consist mostly of high mountain regions probably not required for development for many years." Public use of the areas is diminishing. "It seems clear that preservation of large wilderness areas within national forests is not compatible with basic Forest Service policy, except in several places where timber resources are obviously not needed to sustain local economy for some time to come." On the whole, a most discouraging picture: we are to have wild areas only as long as no one wants them for anything else.

Leopold, A. Starker. (MVZ, U. Calif., Berkeley.) CAN WE KEEP OUR OUTDOOR AREAS? Audubon Magazine 56 (4): 148, 150-151, 179. July-Aug. 1954.

Public refuges, parks, forests, and grazing lands are being attacked and nibbled away. Public opinion for their defense is still 20-50 years away. Our problem is to hold on to these areas until public opinion has matured and these outdoor areas are valued as great city parks now are. Outdoor recreational areas are becoming fewer every year and those that remain are crowded. Hunting on private land is becoming commercialized. This may lead to better wildlife management on private land. It may also mean that free hunting can be perpetuated only on public land. At present we can hardly get and hold on to enough land to manage waterfowl of the Pacific Flyway. "The usual reply to our cries of anguish over this state of affairs is that it is too bad, but recreational frills inevitably must give way to the inexorable advance of civilization. Such a view never fails to raise my hackles. I want to know, why is it inevitable? I want to know further, what is civilization?"

Nature Conservancy. HOW TO PRESERVE AN AREA FOR ITS NATURAL VALUE. The Nature Conservancy, (607 G St. S.E., Wash. 3, D. C.) Information Bulletin no. 4. 1-8 p. Revised June 1954.

A leaflet that contains many practical suggestions on how to establish and maintain a protected natural area. It distinguishes between strictly protected natural area preserves and areas that are managed or partially protected and therefore require different handling. Legal methods of setting up an area are discussed. Ownership and administration present great problems over long periods; it is well to have ownership vested in a large interested group with the proviso that the ownership can be transferred if requirements are not met. Ownership by a public agency may lead to pressures for all sorts of undesirable "developments." When possible, funds for maintenance should be provided. Buffer zones are desirable, and parking lots, buildings, and the like should be located in these buffer zones. Policies and standards for administration are considered. It is gratifying to note that control of overpopulations is listed as one possible need in administration of areas being kept completely natural. Past failures to face this need have led to severe damage to some fine lands.

Shanklin, John F., committee chairman. FOREST TYPES PROTECTED WITHIN NATURAL AREAS. Journal of Forestry 52 (5): 375-383. May 1954.

The committee on Natural Areas of the Society of American Foresters has revised its list of areas on which American forest cover types are preserved. The list, an 8-page table, is arranged by forest cover types, of which 304 are recognized. Natural areas are listed for most but not all types. Information given for each area includes size, location, and responsible agency.

WILDLIFE--NATURAL AREAS AND REFUGES--Continued

Vessels, Jay. (Tex. Game Comm.) THE ROB AND BESSIE WELDER WILDLIFE REFUGE. Texas Game and Fish 12 (6): 12-14, 29, 31, illus. May 1954.
The late R. H. Welder, rancher and oilman, bequeathed a 7,799-acre tract of South Texas grassland as a wildlife refuge. The will entrusted the refuge to 3 trustees, who are given wide latitude in its management, and provided ample funds for maintenance. The range is said to be in good condition and well stocked with game. Research and related work on the refuge is to be encouraged. The area need not be an inviolate sanctuary: hunting, trapping, stock raising and other operations may be conducted if the trustees believe that they will further the purposes of the trust. [The tract is large. Would it not be advisable to allow some part of it to develop undisturbed as a natural area?]

Wirth, Conrad L. (Nat. Park Service.) THREATS TO OUR NATIONAL PARKS. Audubon Magazine 56 (4): 174-178, illus. July-Aug. 1954.
Threats to the parks and to natural conditions in them come from people interested in mining, drilling, logging, grazing, and impoundments. These people can generate local sentiment on their side with rapidity. If they are allowed to prevail, the parks will lose their natural character and will no longer be able to serve purposes for which they were intended. The best defense against damaging encroachments is the continuous and enlightened support of a definite and positive park conservation program.

WILDLIFE--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Kalmus, H. (Galton Lab., U. Coll., London.) SUN NAVIGATION BY ANIMALS. Nature 173 (4406): 657-658. April 10, 1954.
Brief review of what is known of this subject from experiments with birds and invertebrates. 15 references, mostly to European journals.

Lehrman, Daniel S. (Rutgers U.) A CRITIQUE OF KONRAD LORENZ'S THEORY OF INSTINCTIVE BEHAVIOR. Quarterly Review of Biology 28 (4): 337-363. Dec. 1953.
Work of the Lorenz-Tinbergen school has gained wide acceptance among naturalists, most of whom are unable to judge it. This article presents an appraisal from the viewpoint of the scientific animal psychologist. Everyone interested in the subject certainly should read it. It shows that much descriptive and experimental work of the Lorenz-Tinbergen school is sound and valuable. It also shows--convincingly--that the neurological and theoretical interpretations of Lorenz and Tinbergen are not only highly fallacious but based on a great deal of reasoning by analogy and disregard of contrary evidence. One of the worst features of the Lorenz-Tinbergen school is that an instinctive act is considered completely preformed and largely independent of experience. Lehrman demonstrates, with a number of examples, that such acts undergo development in the individual. Their development is dependent on and can be modified by many factors. Explaining these acts as innate and preformed obscures the facts and blocks investigation of their origin and development in individuals. Instinctive tendencies no doubt exist, but their expressions are by no means as predetermined and independent of experience as Lorenz and Tinbergen make out. Furthermore, an "instinctive act" is not represented in the central nervous system by a special center that is practically isomorphic with the act. Lehrman's article illuminates many other basic weaknesses. His paper is basically nontechnical and requires no background in neurology or psychology. 147 references.

WILDLIFE--BIOTAS, COMMUNITIES, GENERAL ECOLOGY

Coggin, Joe L. A WILDLIFE SURVEY OF PATRICK COUNTY, VIRGINIA. M.S. thesis, Virginia Polytechnic Institute. 162 p. June 1954.
Survey procedure consisted essentially of personal interviews with 160 farmers selected by "area sampling." Data on farms, wildlife populations, and farmer-hunter and farmer-fisherman characteristics and attitudes were obtained by use of a standard questionnaire.--V. Schultz.

WILDLIFE--BIOTAS, COMMUNITIES, GENERAL ECOLOGY--Continued

Kendeigh, S. Charles. (U. Ill.) HISTORY AND EVALUATION OF VARIOUS CONCEPTS OF PLANT AND ANIMAL COMMUNITIES IN NORTH AMERICA. Ecology 35 (2): 153-171, maps. April 1954.

A critical review of the many systems that have been proposed for classifying biological areas. Among the better known of these are the life zone, association and formation, biotic area, and biome systems, but many earlier or diverging systems are also discussed. In closing the author stresses the advantages of using the biome system with biociations and biocies as subdivisions. 112 references.

Murie, Adolph, and Walter A. Weber. (Nat. Park Service.) WILDLIFE OF MOUNT MCKINLEY NATIONAL PARK. National Geographic Magazine 104 (2): 249-270, illus. Aug. 1953.

Includes several fine color plates of birds and mammals, large and small, and brief notes on natural history of grizzly bears, wolves, caribou, red foxes, surfbird, wandering tattler, golden eagle, Toklat vole, and Dall sheep.

Shelford, V. E. (U. Ill.) SOME LOWER MISSISSIPPI VALLEY FLOOD PLAIN BIOTIC COMMUNITIES; THEIR AGE AND ELEVATION. Ecology 35 (2): 126-142, maps. April 1954.

Discusses plant and animal communities and some of the physical factors (especially water levels) affecting them. Chief study area was vicinity of Reelfoot Lake, Tenn. Secondary study area was Big Island in White River National Wildlife Refuge, Ark.

Woodbury, Angus M. (U. of Utah.) PRINCIPLES OF GENERAL ECOLOGY. Blakiston Co., N. Y. & Toronto. viii + 503 p., illus. 1954. $6.00.

This book is designed as a text for a one-semester college course in general ecology at upper-division level. As the author states, it is an attempt to outline fundamental principles. Chemical, physical, and even astronomical bases of ecology are given considerable attention. The rest of the book discusses such subjects as community analysis, food relations, population problems, adaptations, evolution, and geographic distribution. The value of the book as a text will have to be decided by teachers. One ecology teacher is reported to favor the treatment used. The reviewer, however, believes that, for wildlife workers at least, much of what is gained by the fundamental approach may be lost by abstractness. More concrete examples distributed through the book would help correct this condition. Some topics suffer from too short a treatment, with lack of coverage of some points of view on controversial subjects. For example, the reader is left with the impression that sunspots are responsible for cycles, but that their effects are obscured by delays in producing effects. Other ideas on cycles are given little attention. The book is well indexed and has many illustrations, including numerous photographs, charts, tables, and graphs. There is a bibliography of approximately 450 titles.--Fred H. Dale.

WILDLIFE--NUMBERS AND NUMBER FLUCTUATIONS

Chitty, Dennis. (Bureau of Animal Population, Oxford, Eng.) TUBERCULOSIS AMONG WILD VOLES: WITH A DISCUSSION OF OTHER PATHOLOGICAL CONDITIONS AMONG CERTAIN MAMMALS AND BIRDS. Ecology 35 (2): 227-237, map. April 1954.

After reporting results of an extensive field and laboratory study, Chitty concludes that tuberculosis cannot have been the cause of heavy die-offs that were observed. He then critically reviews papers on Toxoplasma in voles and Trichostrongylosus and Eimeria in red grouse, concluding that these parasites cannot be shown to have caused population fluctuations. "Infectious disease, it is suggested, is only one of several mortality factors to which certain mammals and game birds are less resistant at some population densities than others." Evidence drawn from a number of papers indicates that disease, unfavorable weather, etc., often fail to reduce populations. Whether they do so or not depends largely on physiological state of parents and young. "The suggestion which emerges...is as follows: that the probability of survival of

WILDLIFE—NUMBERS AND NUMBER FLUCTUATIONS—Continued

the young of certain animals is largely predetermined by the physiological condition of their parents... We should now perhaps regard infectious disease as only one of a complex group of biotic and physical factors any one of which may be the actual cause of death in physiologically deranged animals... The problem then becomes of more general interest, i.e. to determine what change in the population makes its members more vulnerable to normal hazards."

Fujita, Hiroshi. (Kyoto U., Maizuru, Japan.) AN INTERPRETATION OF THE CHANGES IN TYPE OF THE POPULATION DENSITY EFFECT UPON THE OVIPOSITION RATE. Ecology 35 (2): 253-257, graphs. April 1954.

Mathematical study of population effects most commonly studied in insect cultures. Reasons for different types of population curves are explained.

Hutchinson, G. E., and E. S. Deevey, Jr. (Yale U.) ECOLOGICAL STUDIES ON POPULATIONS. In G. S. Avery, Jr., editor, Survey of Biological Progress, vol. I. Academic Press, N. Y. p. 325-359, graphs. 1949.

Concise, technical review (99 references). Many phases of the subject are considered, some of them mathematically. Animals discussed range from laboratory invertebrates to wild game. Although it is now 5 years old, this paper should still be of value as a critical appraisal of many related subjects from a variety of fields. Among topics treated are: growth of a population, natality and density, optimum density in natural populations, life-table studies of wild and laboratory animals, mortality and population density, competition between two species, experiments on diversification of niches, possibility of nonlinear competition functions, intrinsic and extrinsic cycles, and cycles of various lengths.

Lack, David. (Ed. Grey Inst., Oxford, Eng.) THE EVOLUTION OF REPRODUCTIVE RATES. In Evolution as a Process, edited by J. S. Huxley, London, 1954, pages 143-156. 1954.

"(1) The thesis advanced here is that the reproductive rate of animals, like other characters, is a product of natural selection, hence that each species lays that number of eggs which results in the maximum number of surviving offspring. (2) In nidicolous birds, clutch-size is limited by the number of young that the parents can feed. With broods above normal size, fewer, not more, young are raised per brood. In many species, clutch-size can be modified within limits to suit the particular feeding conditions. Similar considerations hold for mammals... (3) In animals which do not feed their young, the number of eggs laid is probably the maximum that the parent can produce, but this is greatly influenced by the size of the eggs... An inverse correlation between egg-number and egg-size is found... (4) The decline in fecundity with rising population density, found in both birds and invertebrates, is primarily a response to a dwindling food supply for the young, and not to population density as such. As part of this response, birds, diptera and other mobile animals move away from places where conditions are less favorable, and so tend to be dispersed rather evenly for breeding."

Nicholson, A. J. (Commonwealth Sci. & Indus. Res. Organization, Canberra.) EXPERIMENTAL DEMONSTRATIONS OF BALANCE IN POPULATIONS. Nature 173 (4410): 862-863, graph. May 8, 1954.

Report of experiments with Lucilia cuprina populations in which various limiting factors were introduced. Regularly spaced population peaks and lows were produced by competition. "...low populations induced the rapid generation of new individuals, whereas high populations suppressed reproduction and so dwindled..." When many individuals were destroyed, the rest were able to breed more successfully, thus maintaining population balance. "...compensatory reaction to density change is a feature of all kinds of stable population systems, and...it is dominantly responsible for the regulation of populations of all kinds of animals."

WILDLIFE--PARASITES AND DISEASES

Chandler, Asa C. (Rice Inst.) NEW STRIGEIDS FROM MINNESOTA BIRDS AND MAMMALS. American Midland Naturalist 52 (1): 133-141, illus. July 1954.
New species of flukes from skunks, cats, grouse, and yellowlegs.

Cook, Edwin F. (Minn. Agr. Exp. Sta., St. Paul 1.) A TECHNIQUE FOR PREVENTING POST-MORTEM ECTOPARASITE CONTAMINATION. Journal of Mammalogy 35 (2): 266-267. May 1954.
Some published host records are highly suspect. A number of suggestions are made for avoiding contamination. Also, "It is suggested that records of ectoparasites from other than their normal hosts should not be published unless there is clear evidence that no contamination was possible. It would also be most useful if techniques of collecting, precautions against contamination, some indication of the numbers of ectoparasite specimens obtained, and the number of host specimens examined were also included with published ectoparasite records."

Robinson, Edwin J., Jr. (U. S. Public Health Service, Newton, Ga.) NOTES ON THE OCCURRENCE AND BIOLOGY OF FILARIAL NEMATODES IN SOUTHWESTERN GEORGIA. Journal of Parasitology 40 (2): 138-147. April 1954.
These worms were found in many birds and mammals but in no reptiles or amphibians.

WILDLIFE--MORTALITY FROM INSECTICIDES, WEATHER, CARS, ETC.

Author? A DDT TOXICITY EXPERIMENT. Journal of the American Veterinary Medical Association 125 (928): 72. July 1954.
"When alfalfa hay treated with DDT was fed to 44 pigs from weaning until they were marketed, their rate of gain was not affected nor were there pathological changes in the liver or kidneys. When raw fat, cured bacon, and shoulders containing 2.2, 2.3 and 5.3 p.p.m. of DDT, respectively, were fed to rats for fourteen weeks, their rate of gain was unaffected and their tissues remained normal.--J. Am. M. A., April 3, 1954." Copied completely.

Helmuth, William T., III (deceased). THE HURRICANE OF 1938,--IN RETROSPECT. Birds of Long Island no. 8. 225-241. June 1954. (Obtainable from Mrs. H. M. H. Kimball, 86 Fourth St., Garden City, N. Y.)
The hurricane struck Long Island in September with such force that dunes were blown over fields and forests, new channels were cut into coastal waters, fields were washed into the sea, trees were blown down, shrubs were stripped, and seaweed was draped over telephone wires $\frac{1}{4}$-mile inland. Marine and fresh water life was heaped up in knee-deep windrows. The author was present and studying birds before and after the storm. His account is graphic but factual. Thousands of birds were drowned or battered to death. A list is given of birds found dead. Some birds flew before the storm. Many small birds huddled together in the bases of bushes and probably survived if not flooded. Many others squatted on the ground behind what windbreaks they could find. "They clustered in the lee of the windbreaks in wedge-shaped formations, the bases of the wedges pressed closely against the protective barrier, the apices (consisting of long 'tails' of birds) trailing away to leeward in 'Indian file.'" One of these groups took off and was immediately dashed away. A group of swans rode out the storm despite huge waves. Some birds withstood the storm in unexplained fashion, but certain species were hard hit. Disproportionately large numbers of pheasants were killed. Hordes of Microtus were drowned, but in the following winter and spring hawks and owls were feeding heavily on them, even, apparently, in the most ravaged areas. Now, more than a dozen years later, changes in flora and fauna of the area are far less than expected in 1938.

WILDLIFE—MORTALITY FROM INSECTICIDES, WEATHER, CARS, ETC.—Continued

Longley, William H. (Minn. Div. Game.) HORSEPOWER VS. WILDLIFE. Conservation Volunteer 17 (98): 45-48, illus. March-April 1954.
The 12 Minn. area game biologists kept account of all road kills seen from Aug. 1949 to Aug. 1951. This paper discusses (but does not tabulate) the results, with particular attention to effect of such factors as weather and population levels. The conclusion is that road kills usually have little effect on populations. Yet when there is deep snow, a flocking species such as pheasant can suffer heavy losses. This is especially true when birds must cross highways between roosting and feeding places. And farm windbreaks are often close to roads. The situation may become worse with present improvement of back roads and accelerated destruction of winter cover.

Yocom, Charles F. (Humboldt St. Coll.) 2,4-D AND ITS RELATIONSHIP TO WILDLIFE. Murrelet 35 (1): 5-7. Jan.-April 1954.
A warning, not a report of studies. Summary: "It is obvious that indiscriminate spraying with 2,4-D could harm any of the areas established by the State Game Department. In view of the fact that farm game species are worth nearly $25,000,000 annually and that the State Game Department is spending over $1,300,000 in operation and salaries...it seems imperative that use of 2,4-D should be regulated to avoid unnecessary damage to public and private properties for the welfare of the people... In most cases game farm species adjust and thrive under good agricultural practices, but it is evident that indiscriminate spraying with 2,4-D is not a wise agricultural procedure."

WILDLIFE—MANAGEMENT—GENERAL

Blouch, Ralph I. (Mich. Dept. Cons.) INTRODUCTIONS ALL AROUND. Michigan Conservation 23 (3): 6-9, illus. May-June 1954.
Story of introductions of game birds and mammals into Mich., and how the new forms have fared. The list is long, but only pheasants and sharptails are thriving.

Byrd, Mitchell A. ECOLOGICAL SUCCESSION ON ABANDONED FARMLAND AND ITS RELATIONSHIP TO WILDLIFE PRODUCTION IN CUMBERLAND COUNTY, VIRGINIA. Ph.D. thesis, Virginia Polytechnic Institute. 210 p. June 1954.
A study of trend of secondary plant succession on abandoned farmland in Piedmont Region of Va. and interpretation of this information in terms of wildlife habitat management practices.—V. Schultz.

Chapman, Floyd B. (392 Walhalla Rd., Columbus 2, Ohio.) WILD TURKEY, RUFFED GROUSE, AND SNOWSHOE HARE RESTORATION IN OHIO. Ohio Department of Natural Resources, Final Report Federal Aid Project W-80-D-1. 1-10 p., map. July 1954.
Gives details on releases, on sources of stock, and on studies of released animals. Establishment is not yet certain but some encouraging signs were noted in 1954.

Dambach, Charles A. (Ohio Div. Wildl.) WILDLIFE IN THE MUSKINGUM WATERSHED. Ohio Conservation Bulletin 18 (7): 6-7, 31, illus. July 1954.
General discussion of the beneficial effects on wildlife of the Muskingum Watershed Conservancy District. Many species have been favored by improved management of land and water.

Knott, Norman P. (Wash. Dept. Game.) PLANTING AND GROWTH REQUIREMENTS OF WOODY PLANTS. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm'rs., June 1-3, 1953. p. 224-231. [1954.]
This thoroughly practical article on how to establish plantings for big game and upland birds is based on a great deal of experience in Washington State. Much of the information should apply anywhere. The first essential is to make sure the planting will fit into and help existing habitat, that it will not be isolated, that it will not cause animals to concentrate where mortality will be heavy. Be sure the strain of plant used is adapted to the site; existing vegetation is best indicator of site factors. Good planting stock of high viability

WILDLIFE--MANAGEMENT--GENERAL--Continued

is important; if you cannot get it, wait until you can. Proper storage conditions are described. Without them losses are apt to be great. It is vital to keep roots moist during handling--one minute of exposure to dry wind or sun can result in a dead plant. Figures show that site preparation is not only economical but virtually indispensable. Cultivation for 1-3 years after planting is not very costly but allows plants to become established well enough to resist competition that otherwise would be serious. Gist of the whole article is that planting must be carefully planned and wisely handled at each step or all effort is liable to be wasted. List of plants tested is given, with indication of those showing promise for big game or upland birds.

Moore, Paul, compiler. (Ohio Div. Wildl.) THE AUGUST GAME SURVEY - 1953. Ohio Division of Wildlife, Game Management Leaflet no. 31. 2 p. + 4 maps. Aug. 1953.

Reports road counts (1951-53) of 13 game or fur species and crow. Rabbits were up markedly, pheasants a little. Hungarian partridges apparently weathered their first open season since 1946 with little change of numbers. Doves increased and raccoons remained high.

Murie, Olaus J. (Moose, Wyo.) ETHICS IN WILDLIFE MANAGEMENT. Journal of Wildlife Management 18 (3): 289-293. July 1954.

This essay is, in part, a plea for wildlife biologists not to limit themselves to their counts and techniques, but to take an active interest in social trends that depend on broader and keener appreciation of nature.

PROCEEDINGS OF THE THIRTY-THIRD ANNUAL CONFERENCE OF WESTERN ASSOCIATION OF STATE GAME AND FISH COMMISSIONERS, Long Beach, Calif., June 1-3, 1953. xii + 309 p., mimeo., map and graphs. [1954.] $2.00 from Ben Glading, Calif. Dept. of Fish and Game, 926 J St., Sacramento 14, Calif.

This paper-bound volume contains 52 consecutively paged papers on game, abstracts of papers of Western Division of American Fisheries Society, and resolutions. Papers of technical sessions are listed individually in this issue of WR. Thirteen papers of the general sessions describe organization of the fish and game departments of the western states and B. C. Other papers of general sessions are: Federal-state cooperation in conservation, by John L. Farley. Sportsmen and commissioners can cooperate, by Lloyd Scouler. Status of some pending bills in Congress, by Carl Shoemaker. Legal aspects of game depredations, by Ralph W. Scott. Looking forward in game management, by Fred Faver. Looking into the future of fish and game resources, by C. J. Campbell. What is the future of Federal Aid? by R. M. Rutherford. Future objectives of big game management, by J. Burton Lauckhart. The future of game and fish on public lands, by Elliott S. Barker. The future management of waterfowl resources, by J. P. Linduska.

Wildlife Society. REPORT OF THE COMMITTEE ON RESEARCH NEEDS. Journal of Wildlife Management 18 (3): 388-391. July 1954.

WILDLIFE--MANAGEMENT--HARVESTS AND HUNTING

Anonymous. [HUNTING STATISTICS FOR TURKEY, DOVE, ELK, AND DEER IN ARIZONA, 1953 OR 1953-54.] Arizona Game & Fish Department Wildlife News 1 (1): 6, 8. June 1954.

Figures for doves bagged are confusingly low. Presumably they refer only to small samples from which hunting statistics were derived.

Hunter, W. A. (Wash. Game Dept.) LANDOWNER-SPORTSMAN RELATIONS. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm'rs., June 1-3, 1953. p. 265-269. [1954.]

In 5 years of work the Wash. State Game Dept. managed to get hundreds of thousands of acres of farmland opened to hunting and learned a lot about how to do it. Findings are discussed here. In general, it was learned that the hunter-farmer problem could not be left up to hunter and farmer groups if results were

WILDLIFE—MANAGEMENT—HARVESTS AND HUNTING—Continued

expected. The state had to detail a staff of men to work with farmers to get posting systems changed, to keep departmental employees informed of and interested in the problem, and to meet with sportsmen's groups. A vigorous information and education campaign, as well as personal contacts, was necessary to get lands opened to hunting and to get hunters to respect rights of farmers.

Marquardt, William C., and Thomas G. Scott. (Ill. Nat. Hist. Survey.) IT'S IN THE BAG. Illinois Wildlife 7 (2): 4-5, maps. March 1952.
Report on 1950-51 hunting season in Ill. Percentage rank of each form of game is tabulated. Seven maps show distribution of hunter density and distribution of varying degrees of hunting success for rabbit, duck, pheasant, squirrel, quail, and dove.

WILDLIFE—MANAGEMENT—FARM

Bell, James. (Wis. Cons. Dept., Horicon.) HAY OR GAME...OR BOTH? Wisconsin Conservation Bulletin 19 (6): 22-23, illus. June 1954.
Value of flushing bar. Fifty acres of hay were cut using flushing bars. Seven duck nests were found but none was destroyed. Each nest was marked with stake, and swath of about 8 by 20 feet was left around nest to provide concealment from predators. Three of these nests hatched successfully. One rabbit was killed out of 34 seen, as were 3 pheasants out of 31 (9.7%). A total of 325 acres was cut without using flushing bars. Thirty-one duck and pheasant nests were found, of which 23 were destroyed. Forty pheasants were killed out of 242 seen (16.5%).

Boehnke, Roger. (Iowa St. Coll.) SHEATHING THE PHEASANT MOWER. Iowa Conservationist 13 (5): 33, 39, illus. May 1954.
Ohio flushing bars were tested in Iowa. Ten hayfields were selected. Half of each was mowed with flushing bar, half without. "About 35 per cent more pheasants were killed with mowers not using a flushing bar. Without the bar even hens which were not setting on nests were killed, but no non-nesting hens were killed by mowers with flushing bars attached. The flushing bars caused little hindrance to tractors, and although most farmers are happy to use them, the $20-$30 cost and the time for construction discourages them." Construction and distribution of flushing bars would be a fine project for sportsmen's clubs.

Bue, Gerald T., and Donald H. Ledin. (Minn. Div. Game.) FLUSHING BARS IMPROVE HUNTING. Conservation Volunteer 17 (98): 34-39, illus. March-April 1954.
Minnesota hunters would have 4 times as many pheasants in 1 year's time if they could eliminate 2 causes of mortality: winter kill and mowing losses. Studies have shown that winter kill, which is caused chiefly by severe blizzards, took around 60% of the population in 1951 and again in 1952-53. Preservation and creation of good winter cover would end much of this loss. Studies have also shown that mowing kills 1 hen per about 13 acres mowed and destroys 1 nest per about 7 acres. Per cent of hens killed during first hay cutting may run as high as 37.3, or over 1/3 of the population, and this loss must be added to the 60% winter loss. Limited tests of flushing bars indicated that they reduced mortality by roughly 60%. The state will supply plans for these bars on request.

Gysel, Leslie W. (1623 Roseland Ave., E. Lansing, Mich.) THE VALUE OF SAFFLOWER AS A WILDLIFE FOOD PLANT IN MICHIGAN. Quarterly Bulletin (Michigan State College) 36 (4): 374-377. May 1954.
Summary: "Four varieties of safflower, N-3, N-6, N-8, and N-825, were tested in three locations over a 3-year period under southern Michigan conditions. Two varieties, N-6, and N-8, showed the most promise as winter food for wildlife. Plant development was noticeably affected by weed competition and also seemed to be influenced by differences in subsoil texture. Further testing on various soil types and at different levels of fertility will be necessary before varieties of safflower can be recommended for planting for wildlife food patches."

WILDLIFE—MANAGEMENT—FARM—Continued

Hunter, Carl. (Ark. Game Comm.) THE VALUE OF BICOLOR AND SERICEA FIELD BORDER PLANTINGS TO QUAIL IN ARKANSAS. Journal of Wildlife Management 18 (3): 343-347. July 1954.

Over a 3-year period, 1,336 miles of field borders were surveyed for wildlife sign. Some borders were unimproved, others had various types of wildlife plantings. Use by wildlife was judged by distance between signs. Sericea was used by quail at ratio of 3.53 : 1 over unimproved borders. It was used by quail chiefly for roosting and feeding on insects. Bicolor was used slightly less by quail, chiefly for feeding. Quail used annual food patches more than any other plantings. Unimproved borders had least use. Plantings combining sericea and an annual lespedeza were used more than sericea alone. Cottontails ate leaves and bark of sericea and bicolor and used plantings more than quail did. Old, unmowed sericea plantings attracted rabbits, cotton rats, and whitefooted mice. Few good bicolor plantings were found in state despite big distribution program. Cost of 2/3-acre bicolor strip was about $42. Sericea and annual food patches of equal size cost about $8. Many sericea stands were used by farmers for hay or erosion control. Annual lespedezas were grown as crops. Bicolor had little value to farmers. During drought years, annual food patches of red ripper peas and annual lespedezas gave better food yield than bicolor because they produced earlier, while bicolor was later if not killed. "Use of sericea with an annual lespedeza seems to be the practice best suited to conditions in Arkansas." "Arkansas has probably over-emphasized a program that has not been sufficiently investigated."

Kline, Paul. (N. D. Game Dept.) CONIFERS IN WILDLIFE PLANTINGS. North Dakota Outdoors 16 (11): 12-13, illus. May 1954.

Values and site requirements of various conifers that are or may be used for shelterbelt plantings and wildlife protection in N. D.

McGinnes, Burd S. (Del. Game Comm.) A METHOD OF STORING AND HANDLING SHRUB LESPEDEZA. Journal of Wildlife Management 18 (3): 411. July 1954.

"...shrub lespedeza plants can be stored and transported in a dry state rather than with the use of moss or water. Heeling-in of plants will break the dormancy;" this is not desirable. "Plants which were stored in a dry condition, completely dormant, remained in an excellent state of preservation. Tops were cut from the plants at the time of storage..."

Scheffer, Paul M. (U. S. Soil Cons. Serv.) PLANTING TREES AND SHRUBS FOR WILDLIFE IN THE PACIFIC REGION. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm's., June 1-3, 1953. p. 232-252. [1954.]

The SCS planned a leaflet to aid farmers in planting for wildlife, the leaflet to be prepared and distributed in cooperation with state game departments. Tentative draft of leaflet is given here. Included are lists (for various regions of Calif., Nev., Ore., Wash., and Idaho) of woody plants best adapted for farm wildlife work. Stated for each species are common and scientific name, size range, general information and wildlife value.

WILDLIFE—MANAGEMENT—FOREST AND RANGE

Hagenstein, W. D. (Industrial Forestry Assn., Portland, Ore.) THE TREE FARM PROGRAM—AN ASSET TO FISH AND GAME MANAGEMENT. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm's., June 1-3, 1953. p. 253-259. [1954.]

Also published in J. of Forestry, Sept. 1953. See WR 75: 20.

Kerr, Ed. HOG FISHING IN LOUISIANA. American Forests 60 (5): 28-30, 50, illus. May 1954.

Woods hogs are still allowed to run wild in La. and anyone who bothers them is liable to prosecution by owners. In places hogs make reforestation impossible, devouring not only starchy roots of longleaf pine but also those of slash and loblolly. A hog law is being sought but is opposed by rural legislators. At present fencing is the only solution, and it is too expensive for some owners. A photograph shows clearly how hogs can prevent reforestation. The article also tells how wild hogs are managed by their owners.

WILDLIFE—MANAGEMENT—FOREST AND RANGE--Continued

Moody, Raymond D., Jack O. Collins, and Vincent H. Reid. (La. Wild Life Comm.) OAK PRODUCTION STUDY UNDER WAY. Louisiana Conservationist 6 (9): 6-8, illus. July-Aug. 1954.

Preliminary report on acorn productivity of various oaks in La. Study methods are described and results of chemical analyses of acorns of different species are tabulated.

Morriss, Donald J. (U. S. Forest Service, Asheville, N. C.) CORRELATION OF WILDLIFE MANAGEMENT WITH OTHER USES ON THE PISGAH NATIONAL FOREST. Journal of Forestry 52 (6): 419-422, illus. June 1954.

Cooperative work with N. C. Wildlife Resources Commission has been highly satisfactory and good results are being obtained. Experiments reported here revealed that a regular cut for sawlogs produced more usable deer browse than clearcutting or modified clearcutting. Habitat improvement work for deer is done so as to form a pattern with commercial cuts. This, with salt distribution, gives better deer distribution and lightens pressure on coves. It has proved best to make openings in such a way as to provide maximum amount of border. Old fields and logging roads are fertilized and planted, usually with orchard grass and ladino clover. Planted white pines were heavily browsed. This damage was much reduced by planting in heavy slash or by treatment with repellents, cost of the latter being charged to wildlife funds. Rhododendron, though a forest weed, is an important winter deer food but grows out of reach. Much of it is half-cut and is eventually killed by heavy browsing. Banks of permanent roads are stabilized with cut brush and planted to honeysuckle. Other practices are also described. On the whole, practices for game, forestry, watershed management, and recreation have been fitted together with minimum conflict of interests and considerable mutual benefit.

Schultz, Arnold M. (U. Calif., Berkeley.) RESEEDING MANAGED CHAPARRAL BRUSH AREAS FOR DEER. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm'rs., June 1-3, 1953. p. 260-264. [1954.]

Discusses numerous complexities in establishing grass where Calif. chaparral has been removed by fire or other means. The brush would spring up densely from seeds or sprouts, but grasses are preferred for both livestock and game. Data are given on tests of preferences of cattle and deer for various grasses, productivity and seasonal values of different grasses, density of grass that will suppress brush seedlings, necessity of giving certain grasses at least partial utilization if they are to do well, habitat requirements that restrict utility of various grasses, and methods of planting. "When these variables are superimposed on the various objectives of reseeding and the qualities of different species to meet the objectives, then this whole phase of wildlife habitat improvement seems as complicated and difficult as the field men know it really is."

WILDLIFE--MANAGEMENT--WET-LAND

Clark, Wilson F. CONTROLLING WEEDS AND SCUMS IN SMALL PONDS. Breeder-Stockman 15 (9): 10, 11, 96, 102. Feb. 1954. [From Journal of Range Management 7 (4).]

Filice, Francis P. (U. San Francisco, Calif.) AN ECOLOGICAL SURVEY OF THE CASTRO CREEK AREA IN SAN PABLO BAY. Wasmann Journal of Biology 12 (1): 1-24, maps and graphs. Spring 1954.

Effects of heavily polluted creek on invertebrate faunas of adjacent marsh and water areas. Water areas are given primary consideration, but it is pointed out that the fauna of the marsh drained by Castro Creek is depressed in comparison with that of marshes drained by creeks bearing little or no waste.

Giltz, M. L., and W. C. Myser. (Dept. Zool., Ohio St. U.) A PRELIMINARY REPORT ON AN EXPERIMENT TO PREVENT CATTAIL DIE-OFF. Ecology 35 (3): 418, illus. July 1954.

Describes weakening and death of cattail marshes at west end of Lake Erie. An area was enclosed by fence of ½-inch mesh. Cattail growth inside fence was luxuriant. "It is our belief that the die-off...is due primarily to a combination of carp and muskrat activities and possibly other animals, such as snapping turtles...and the gizzard shad." Water level is important factor because it governs carp activities.

WILDLIFE--MANAGEMENT--WET-LAND--Continued

Ingram, William Marcus, and G. W. Prescott. (U. S. Public Health Service, Cincinnati, Ohio.) TOXIC FRESH-WATER ALGAE. American Midland Naturalist 52 (1): 75-87, illus. July 1954.

Valuable review paper (41 references). It is well established that certain blue-green algae can have serious, often lethal, effect on animals, and it is highly worthwhile to have so much of the literature summarized in this paper. Topics covered are public health importance, toxicity to domestic animals, laboratory studies of toxicity to mammals and birds, toxicity to fish, and chemistry of toxic algae. (See also WR 73 p. 22 and 76 p. 3.)

WILDLIFE--MANAGEMENT--PREDATION, CROP DAMAGE, AND CONTROL

Scott, Ralph W. (Deputy Attorney General of Calif.) LEGAL ASPECTS OF GAME DEPREDATIONS. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm's., June 1-3, 1953. p. 10-16. [1954.]

A state is not liable for damage done by game animals unless it has assumed this liability by statute. Some states have assumed the liability and damage claims against them have snowballed, causing great expense and difficulty. States that have not done so are urged to avoid it. It is better to spend funds on preventive measures that are really needed. Numerous legal decisions are cited, and Colorado's experience with damage payments is described.

WILDLIFE--REPORTS OF ORGANIZATIONS

Idaho. REPORT TO THE IDAHO FISH AND GAME COMMISSION, BY IRA N. GABRIELSON, PRESIDENT, WILDLIFE MANAGEMENT INSTITUTE. Idaho Fish & Game Commission. 51 p., illus. 1953. [From Monthly Checklist of State Publications 45 (6).]

Staff, Patuxent Research Refuge. REPORT OF RESEARCH PROGRESS, 1949 - 1953. U. S. Fish & Wildlife Service, Patuxent Research Refuge, Laurel, Md. ii + 39 p., mimeo. [1954.]

Summarizes 5 years of work at the Patuxent Refuge. Accounts are grouped under the following major topics: Bird Distribution Investigations, Waterfowl Habitat Studies, Economic Ornithology, Gamebird Nutrition and Ecology, Agricultural Wildlife Management Research, Wildlife Disease Studies, Fur Animal Research, Research on Toxicants and Repellents, and Insect Control in Relation to Wildlife. Includes list of technical staff and lists of publications in various fields.

Virginia Advisory Legislative Council. IMPROVEMENT IN THE GAME AND INLAND FISH PROGRAM IN VIRGINIA; A REPORT TO THE GOVERNOR AND THE GENERAL ASSEMBLY OF VIRGINIA. Richmond, Division of Purchase and Printing. House Doc. no. 20. 12 p. 1953. [From Monthly Checklist of State Publications 45 (6).]

Wyoming. ANNUAL REPORT OF THE WYOMING GAME AND FISH COMMISSION 1953. 1-66 p., illus. 1954.

The number of big game animals killed rose to 91,622--probably more than existed in the state early in the century. Both kill and license sales rose sharply in recent years, but license sales dropped a little and the kill increased slightly in 1953. Stockmen strongly contend that the state now has too much big game. Tables show numbers of big game animals taken per management unit, with sex and age breakdown for elk, deer, and moose. Total only is given for antelope. Hunting statistics are also tabulated, as are total kills per species of big game, 1944-53. Beaver harvests, 1941-53, are listed. Damage by big game is discussed, and sums paid on claims are stated for the years 1941-53. PR projects are described in relatively good detail. Results of bird shooting seasons are discussed briefly and releases of game farm pheasants and chukars are tabulated.

MAMMALS—GENERAL

Anderson, John W. (Cornell U.) THE PRODUCTION OF ULTRASONIC SOUNDS BY LABORATORY RATS AND OTHER MAMMALS. Science 119 (3101): 808-809. June 4, 1954.
Reports production of high frequency sounds by 8 species of mammals. "These high-frequency sounds may serve for communication between individual rats; and it is also conceivable, though certainly not yet demonstrated, that rodents use high-frequency sounds for orientation in some manner comparable to the process of echolocation employed by bats."

Anonymous. ANIMAL TRACKS. Stackpole Co., Harrisburg, Pa. 64 p., illus. 1954. $1.50, paper cover.
An attractively printed booklet that has pictures of mammals and their tracks and accompanying text. Drawings by Luis M. Henderson show most American game and fur mammals. Tracks of these are illustrated by sketches or diagrams. Range maps are provided for big game species. The text for a species consists of a few paragraphs on identification and natural history. This booklet is intended mainly for young people, and in thoroughness and accuracy it should not be compared with more technical works. No careful attempt to criticise it has been made, but it is discouraging to note that the peccary is not mapped as occurring in South Texas, although it is present there. The same may be said for deer in southern Indiana. Even worse, perhaps, tracks are not drawn to scale in sections where they are shown side by side for comparison, and few data are given on measurements of tracks.

Holdenried, Robert (St. Michael's Coll., Santa Fe, N. M.) A NEW LIVE-CATCH RODENT TRAP AND COMPARISON WITH TWO OTHER TRAPS. Journal of Mammalogy 35 (2): 267-268. May 1954.
Trap described measures 4 x 4 x 15 inches, is made chiefly of ½-inch mesh hardware cloth, is light in weight, and will capture animals of a wide range of sizes. In a field trial it excelled Sherman traps and Young traps in general efficiency, but not for every species. "The new trap is...simple in design, and may be constructed without particular skill in sheet metal work and with the equipment usually available in home shops or laboratories." Unfortunately, no picture of trap.

Kilham, Lawrence, and James H. Belcher. (Nat. Inst. Health, Bethesda 14, Md.) A DEVICE FOR SAFE HANDLING OF WILD MAMMALS IN THE LABORATORY. Journal of Wildlife Management 18 (3): 402, illus. July 1954.
Handling box for safe transfer from cage to other containers. Animal can be forcefully yet gently expelled from this box by shoving forward a sliding partition.

MAMMALS—FAUNAS AND MANUALS

Halloran, Arthur F., and Willard E. Blanchard. (Wichita Refuge, Cache, Okla.) CARNIVORES OF YUMA COUNTY, ARIZONA. American Midland Naturalist 51 (2): 481-487, map. April 1954.
Annotated list of 10 species, with notes on abundance, distribution, habits, and measurements.

Olin, George. ANIMALS OF THE SOUTHWESTERN DESERTS. Southwestern Monuments Association (Gila Pueblo, Globe, Ariz.), Popular Series no. 8. 1-112 p., maps, sketches. 1954. $1.00.
Interesting booklet on our desert mammals. It is written for the public, especially for visitors to national parks and monuments. Larger and more conspicuous species are given most attention, with only genera or sample species of difficult or inconspicuous groups being discussed. The text is easy reading, is enlivened by personal observations, and is not cluttered with quantitative material that is necessary in technical mammalogies. Species accounts run 1-4 pages. A typical one treats range, habitat, and description briefly with the aid of a range map and a sketch or two, then discusses natural history, often with anecdotes. Readers for whom this booklet is intended should find it pleasing and informative.

MAMMALS--FAUNAS AND MANUALS--Continued

Palmer, Ralph S. (N. Y. St. Mus., Albany.) THE MAMMAL GUIDE / MAMMALS OF NORTH AMERICA NORTH OF MEXICO. Doubleday & Co., Garden City, N. Y. 1-384, illus. 1954. $4.95.

Should be the choice of naturalists who want a single popular handbook on North American mammals. It is important because for the first time we have in one pocket-sized volume (7½ x 5 x 1 in.) much natural history, good range maps, colored illustrations, and field identification data. It is attractive, non-technical, and generally reliable. Subspecies are omitted. Unit of treatment is the species or a small group of very similar species. The 250 colored drawings (all by author) depict 182 representative species. Most of them are good, although somewhat stylized and highly colored. Whales, animal tracks, and a few other subjects are depicted in line drawings. Identification is by pictures, range maps, brief descriptions, external measurements, and notes on habitats, tracks, and voices. No popular guide can provide for identification of mammalian species in large or difficult genera, and this one is no exception. But there is so much other information here that we need not judge this book solely by its value for identification. Palmer has gone deeply into journal literature. He presents concisely a great deal of information on habitats, habits, reproduction, and economic status. Few of his statements need be questioned. However, the myth is perpetuated of young opossums being carried "with tails wrapped around hers as she holds it arched forward over her back." And we doubt that it is a safe generalization that Peromyscus populations fluctuate markedly with peaks about every 3-5 years. Perhaps the greatest weakness of the book is the paucity of references to other works, especially state mammalogies.

Pearson, Paul G. (U. Fla.) MAMMALS OF GULF HAMMOCK, LEVY COUNTY, FLORIDA. American Midland Naturalist 51 (2): 468-480, map. April 1954.

Description of area and its plant communities and annotated list of species. The list includes notes on abundance, habitats, habits, and measurements, with taxonomic comments on moles and cotton mice. Especially interesting is description of involved tricks by which bobcats fool dogs that are trailing them.

Russell, Robert J. (Mus. Nat. Hist., U. Kans.) MAMMALS FROM COOKE COUNTY, TEXAS. Texas Journal of Science 5 (4): 454-464. Dec. 1953.

Tamsitt, J. R. (U. Texas.) THE MAMMALS OF TWO AREAS IN THE BIG BEND REGION OF TRANS-PECOS TEXAS. Texas Journal of Science 6 (1): 33-61, map. March 1954.

Black Gap area, Brewster Co., and La Mota Mountain area, Presidio Co. The areas and their ecology are described and a long annotated list is given.

MAMMALS--COMMUNITIES, NUMBERS, HOME RANGES

Blair, W. Frank. (U. Texas.) FACTORS AFFECTING GENE EXCHANGE BETWEEN POPULATIONS IN THE PEROMYSCUS MANICULATUS GROUP. Texas Journal of Science 5 (1): 17-33. March 1953.

Detailed review paper (80 refs.) that discusses life history, habits, ecology, distribution, and taxonomy of these mice in relation to gene flow.

Blair, W. Frank. (U. Texas.) POPULATION DYNAMICS OF RODENTS AND OTHER SMALL MAMMALS. In M. Demerec, editor, Advances in Genetics, vol. V. Academic Press, N. Y. p. 1-41. 1953.

Valuable, well documented review (119 references). This is one of the papers that should be studied by anyone beginning a mammalian population study. It summarizes and interprets much information on a wide variety of mammals, including some insectivores, carnivores, and marsupials, and discusses divergent views of authors. Home-range phenomena are given most attention, with sections on home-range behavior, range size and factors affecting it, significance of home-range habit, territoriality, and homing. Other topics are dispersal, pattern of reproductive behavior, life span, and pattern of distribution. The paper was written primarily for those interested in population genetics, but it is written clearly and simply and should be of great value to naturalists who want an introduction to or summary of the aspects of population biology that are treated.--L. F. Stickel.

MAMMALS—COMMUNITIES, NUMBERS, HOME RANGES—Continued

Brown, L. E. (Imp. Coll. Sci. & Tech., London.) SMALL MAMMAL POPULATIONS AT SILWOOD PARK FIELD CENTRE, BERKSHIRE, ENGLAND. Journal of Mammalogy 35 (2): 161-176, map and graphs. May 1954.

A 2-year study of Microtus, Apodemus, and Clethrionomys by intensive live trapping at 3-month intervals. Included are: survival and weight data, comparison of field data with population estimates made by different methods, field data on number of catches per individual and discussion of significance. Migratory behavior is postulated as the cause of low numbers of Microtus in June. Apodemus spread into fields when Microtus numbers were low there.—L. F. Stickel.

Howell, Joseph C. (U. Tenn.) POPULATIONS AND HOME RANGES OF SMALL MAMMALS ON AN OVERGROWN FIELD. Journal of Mammalogy 35 (2): 177-186, diagrams. May 1954.

Intensive live trapping on a 14.6-acre plot near Knoxville, Tenn., showed regular use of area by Cryptotis, Reithrodontomys, Peromyscus, Sigmodon, and Mus. Population and home range data are based on results of a month-long trapping period. Mammal distribution is correlated with a cover type analysis. Sigmodon was the most abundant form; of particular interest was the finding that lighter females (under 110 grams) often had ranges entirely outside the centers of cotton rat activity, living in what were probably ecologically poorer areas, while heavier females all ranged within or into the centers.--L. F. Stickel.

Tanaka, Ryo. (Kochi Women's Coll., Kochi City, Shikoku, Japan.) HOME RANGES AND TERRITORIES IN A CLETHRIONOMYS-POPULATION ON A PEAT-BOG GRASSLAND IN HOKKAIDO. Bulletin of Kochi Women's College 2 (1): 10-20, illus. Dec. 1953.

In English. Ranges were derived from capture-recapture data on a 5.6-acre area that was grid-trapped in midsummer. Ranges of females did not overlap, which suggests territorial behavior. Nearly all adults were in breeding condition.—L. F. Stickel.

MAMMALS—PARASITES AND DISEASES

Banfield, A. W. F. (Canadian Wildl. Service, Ottawa.) TULAREMIA IN BEAVERS AND MUSKRATS, WATERTON LAKES NATIONAL PARK, ALBERTA, 1952-53. Canadian Journal of Zoology 32 (3): 139-143, illus. June 1954.

Author's abstract: "A tularemia epizootic occurred in aquatic mammals... during the winter of 1952-53. Pasteurella tularense was isolated from tissues of beaver...muskrat...and from two water samples taken from affected streams. The course of the outbreak, including the contamination of the streams, resembled conditions described in northwestern United States by Parker, Steinhaus, Kohls, and Jellison."

Hedeen, Robert A. (Ft. Sam Houston, Texas.) ECTOPARASITES OCCURRING ON MAMMALS IN THE VICINITY OF FORT HOOD, TEXAS. Texas Journal of Science 5 (1): 125-129. March 1953.

Lists, by hosts, ectoparasites of 200 mammals of 21 species.

Joyce, Charles Raymond. ANOPLURA AND MALLOPHAGA INFESTING MAMMALS OF IOWA. Ph.D. thesis, Iowa State College. 1952. [From long abstract in Iowa State College Journal of Science 28 (3).]

"The chief purpose of this work is to bring together the records of lice species which occur on mammals in this region, to present their synonymy together with a brief description of all species concerned, and to develop a usable well-illustrated key to these species." Includes host index.

MAMMALS--CONTROL, MORTALITY

Elliott, H. Nelson. (US F&WS, Box 1317, Sacramento 6, Calif.) PREDATORY ANIMAL CONTROL [IN CALIFORNIA IN 1953]. California Department of Agriculture, The Bulletin 42 (4): 282-284, illus. Oct.-Dec. 1953. [1954.]
"The work in 1953 was conducted at approximately the 1952 level. A force of approximately 80 hunters destroyed 6,893 coyotes, 3,106 bobcats, 108 troublesome bears and three mountain lions, a total of 10,056 accredited animals, an increase of 995 over 1952. ...there has been a continued increase in instances where special effort was required to control raccoons, fox, skunk, and opossum to protect poultry." Steel traps accounted for most animals, but poison baits and coyote getters were important in coyote control. An experimental effort to control coyotes with Warfarin and Pival is described.

MAMMALS--SHREWS, MOLES, BATS

Dalquest, Walter W., and Henry J. Werner. (Midwestern U.) HISTOLOGICAL ASPECTS OF THE FACES OF NORTH AMERICAN BATS. Journal of Mammalogy 35 (2): 147-160, illus. May 1954.
Includes comments on relationships of families.

Eadie, W. Robert. (Cornell U.) SKIN GLAND ACTIVITY AND PELAGE DESCRIPTIONS IN MOLES. Journal of Mammalogy 35 (2): 186-196, graphs. May 1954.
Glandular stains, which vary seasonally and individually, are described. Their effect on subspecific taxonomy of moles is discussed with the conclusion that certain races should be dropped.

Johnson, Murray L., and C. Wesley Clanton. (Mus. Nat. Hist., Coll. Puget Sound.) NATURAL HISTORY OF SOREX MERRIAMI IN WASHINGTON STATE. Murrelet 35 (1): 1-4, graph. Jan.-April 1954.
Localities, habitat, food habits, reproduction, molting, parasites, trapping.

Kowalski, Kazimierz. CAVE DWELLING BATS IN POLAND AND THEIR PROTECTION. Ochrona Przyrody 21: 58-77, illus. 1953.
Habits and ecology of Rhinolophus hipposideros, Myotis myotis, and M. emarginatus, with notes on other species. Caves most important for bats are named and proposed for protection. Long English summary.

Málaga-Alba, Aurelio. (Pan Amer. Sanitary Bureau, Mexico, D. F.) VAMPIRE BAT AS A CARRIER OF RABIES. American Journal of Public Health and the Nation's Health 44 (7): 909-918, illus. July 1954.

Naggiar, Maurice H. MOLE CONTROL IS A CINCH! Pest Control 22 (8): 9-10, 12, 14, illus. Aug. 1954.
Control by trapping, poisoning, and reduction of food supply by insecticides.

Pruitt, William O., Jr. (Arctic Aeromedical Lab., Fairbanks, Alaska.) NOTES ON THE SHORTTAIL SHREW (BLARINA BREVICAUDA KIRTLANDI) IN NORTHERN LOWER MICHIGAN. American Midland Naturalist 52 (1): 236-241. July 1954.
From summary: Specimens "were examined for possible age determination criteria and it was found that tooth wear was the most reliable of any criteria examined. It was found that the Blarina of the region had a complete breeding season, the onset of which varied in different microhabitats. Some of the implications of this complexity are discussed. The Blarina population on an area of virgin northern hardwoods was found to have a sex ratio of 1 male to 2+ females, while the ratio on areas of secondary succession was found to be the reverse. The usual 2 male to 1 female ratio is explained on the basis of males being the primary invaders of areas of secondary succession."

Twente, John W., Jr. (U. Mich.) PREDATION ON BATS BY HAWKS AND OWLS. Wilson Bulletin 66 (2): 135-136. June 1954.
Reports several observations in Kans. and Okla.

MAMMALS--RABBITS AND PIKAS

Clanton, C. Wesley, and Murray L. Johnson. (Mus. Nat. Hist., Coll. Puget Sound.) WHITE-TAILED JACK RABBIT IN WASHINGTON. Murrelet 35 (1): 15. Jan.-April 1954.

"During the high population of the black-tailed jack rabbit...in eastern Washington before the 1941 die-off, the white-tailed jack rabbit...was thought to be close to extermination. It is therefore a pleasure to place on record the good population that has been observed over the past five years. Localities are scattered over most of eastern Washington...[localities listed]. ...although the ranges of the two species overlap there is a definite preference of the black-tailed jack rabbits for heavy sage brush areas, the white-tailed jack rabbits for the open country, particularly at higher elevations. In winter the white-tailed jack rabbit descends to the sage brush bottoms."

Davis, David E. (Johns Hopkins School of Hygiene, Baltimore.) PLENTY FOOD--PLENTY RABBITS. Maryland Conservationist 31 (4): 22-23, illus. July 1954.

Cottontails of an eastern Md. island were killed off about 1928 by intensive cultivation, disease, and overhunting. By 1948 the farming pattern had changed and good cover had developed. One pair of cottontails was released in Oct. 1948. By 1951, 50-60 rabbits were shot and great horned owls took many others. In 1952 and 1953 about 100 were shot each year without hurting spring populations. Yield is about 1 rabbit per acre; spring population is about 2-3 per acre. The explanation is simply good food and cover. Perhaps 1/3 to 1/2 the population can be shot each fall. Possibly more than that should be shot to reduce likelihood of epizootics. A high proportion of the rabbits have had spotted fever germs and regularly have ticks, but the disease has not appeared in people on the island. Tularemia has not been found in these rabbits.

Geis, Aelred D. (Mich. St. Coll.) RABBIT DAMAGE TO OAK REPRODUCTION AT THE KELLOGG BIRD SANCTUARY. Journal of Wildlife Management 18 (3): 423-424. July 1954.

Abandoned fields in grass-shrub stage were excellent rabbit habitat. Many young oak trees (mostly Q. velutina) were attempting to grow in them. Eighty-nine percent of 212 young oaks examined had been used as winter food by cottontails, mostly by pruning and barking. Damages are described and treated statistically. Many young oaks had had each year's growth pruned back annually for many years. Damaged trees not only had little growth but were bushy, had more dead limbs, and more heart-rot. Oak is the most important forest type in southern Mich., and lack of adequate reproduction is a problem. It seems that locally, at least, rabbits may have an important effect in hindering perpetuation of oak as a dominant species.

REPORT OF THE ADVISORY COMMITTEE ON MYXOMATOSIS. Ministry of Agriculture and Fisheries; Department of Agriculture for Scotland. H.M.S.O., London. iv + 14 p. 1954. 9d. [From long review by G. Lapage, Nature, May 8, 1954.]

"...describes the history and nature of this disease, its present distribution in Great Britain, the protection of domesticated rabbits from it, the harm done by rabbits to agriculture and the present recommendations of the Committee with regard to the disease." Six outbreaks have occurred in Britain. More than 99% of infected rabbits have died, but survivors are immune. Value of wild rabbits in Great Britain amounts to about £15 million a year, but damage rabbits do amounts to 3-4 times this much. A national campaign to exterminate wild rabbits is recommended. But myxomatosis is to be neither spread nor controlled. It is to be allowed to run its natural course. Attempts will be made to eliminate survivors before they are able to produce numerous immune offspring. Protective vaccine should be made available to breeders of domestic rabbits.

Southern, H. N. (Bureau Animal Population, Oxford, Eng.) SEXUAL AND AGGRESSIVE BEHAVIOUR IN THE WILD RABBIT. Behaviour 1 (3-4): 173-194. 1948.

Observations of visibly marked rabbits (Oryctolagus cuniculus) for three years permitted a description of social behavior. Sexual behavior consisted of chasing, tail flagging, emurination, copulation and grooming. Adult does chased away young does during the breeding season. Only a few of the largest bucks participated in sexual activities. Some young bucks were driven out.--D. E. Davis.

MAMMALS--RABBITS AND PIKAS--Continued

Thompson, Harry V., and C. J. Armour. (Ministry of Agr., Hook Rise, Tolworth, Surbiton, Eng.) METHODS OF MARKING WILD RABBITS. Journal of Wildlife Management 18 (3): 411-414, illus. July 1954.
Describes use of plastic discs, chick tabs, and tattooing. Experiences with these methods are discussed. Discs provide identification at a distance. Tattooing is permanent. Chick tabs with numbers painted on are intermediate in both respects.

MAMMALS--RODENTS--MISCELLANEOUS

Anderson, Sydney. SUBSPECIATION IN THE MEADOW MOUSE, MICROTUS MONTANUS, IN WYOMING AND COLORADO. University of Kansas Publications, Museum of Natural History 7 (7): 489-506, maps. July 1954.
Recognizes 4 subspecies, 2 of them new, in states named.

Anonymous. [ALUMINUM FOIL TO PROTECT FRUIT TREES FROM RODENTS.] Conservation News 19 (11): 10. June 1, 1954
"An orchardist near Savannah, Ohio, has been experimenting with a new idea to protect his young fruit trees from damage by rabbits and mice. Mr. Robert C. Allen has used various methods in an attempt to prevent his young fruit trees from being girdled and has achieved the best results by using aluminum foil. The foil is crimped, not wrapped, around the base of the tree up to a height which the animals cannot reach. The crimping allows the tree to grow and the foil is replaced each year." Copied completely.

Atkinson, Laurel L. (Calif. Dept. Agr.) [RODENT CONTROL IN CALIFORNIA, 1953.] California Department of Agriculture, The Bulletin 42 (4): 274-282, illus. Oct.-Dec. 1953. [1954.]
Rodent-borne diseases are considered of much less importance because of antibiotics and better cooperation of local health officials. Nevertheless, more control emphasis is being placed on small rodents in plague areas, because they come in closer contact with people than do ground squirrels. Anticoagulant rodenticides give very good control of them. For economic reasons, increasing attention is being given to gophers and field mice. Muskrats are causing much damage, especially in rice growing areas; control research and operations on them are being stepped up. Crop damage by jackrabbits remains a pressing problem. Feral nutria seem to have been exterminated except at one place, which is being kept for study. Many quantitative data are given on control work done during year, and methods used are outlined.

Blair, W. Frank. (U. Texas.) TESTS FOR DISCRIMINATION BETWEEN FOUR SUBSPECIES OF DEER-MICE (PEROMYSCUS MANICULATUS.) Texas Journal of Science 6 (2): 201-210, map. June 1954.
Experimental breeding tests were run with 4 subspecies from Okla., Texas, and N. M. The mice crossed freely, showing no evidence of any reproductive isolation between subspecies.

Conaway, Clinton H. (U. Wis.) THE REPRODUCTIVE CYCLE OF RICE RATS (ORYZOMYS PALUSTRIS PALUSTRIS) IN CAPTIVITY. Journal of Mammalogy 35 (2): 263-266. May 1954.
Summary: "The length of 21 vaginal estrous cycles in a total of seven rice rats were 7.62±0.19 days with a range of six to nine days. Cell types found in the vaginal smear and the ovarian anatomy throughout the cycles are similar to those of the Norway rat. Ovulation appears to occur late in vaginal proestrum or early in estrus. Data from both vaginal cycles and litters born in captivity show no interruption of reproductive activity during the winter. Limited data indicate puberty is reached at about 50 to 60 days of age in both sexes."

MAMMALS--RODENTS--MISCELLANEOUS--Continued

Cowan, Ian McT., and Margaret G. Arsenault. (U. Brit. Col.) REPRODUCTION AND GROWTH IN THE CREEPING VOLE, MICROTUS OREGONI SERPENS MERRIAM. Canadian Journal of Zoology 32 (3): 198-208, graphs. June 1954.
Authors' abstract: "The growth and reproduction...has been studied in the laboratory and in the wild. Growth data arise largely from 28 captive born litters. It has been determined that gestation is 23½ to 25 days; that mean litter size is 2.95; that a postparturient oestrus is usual but frequently does not occur; that puberty occurs at 22-24 days in females and 34-38 days in males; that there is a sterile period of 5 to 14 days between first oestrus and first conception; longevity in captivity exceeded 320 days but in the wild there was a complete annual turnover. Instantaneous relative growth rates have been determined for four distinguishable phases of growth. A limited experiment using light and heat to stimulate increased reproduction had equivocal results."

Dexter, Ralph W. (Kent St. U., Ohio.) DISTRIBUTION OF THE MEADOW JUMPING MOUSE ZAPUS HUDSONIUS IN OHIO. Journal of Mammalogy 35 (2): 233-239, map. May 1954.
Includes discussion of habitats and possible correlation of abundance with life zones.

Dice, Lee R. (U. Mich.) BREEDING OF PEROMYSCUS FLORIDANUS IN CAPTIVITY. Journal of Mammalogy 35 (2): 260. May 1954.

Doran, David J. (USDA, Beltsville, Md.) A CATALOGUE OF THE PROTOZOA AND HELMINTHS OF NORTH AMERICAN RODENTS. I. PROTOZOA AND ACANTHOCEPHALA. American Midland Naturalist 52 (1): 118-128. July 1954.
Lists parasites with host records and references. Unfortunately, the manuscript apparently was completed before Van Cleave's monograph (see WR 75: 70) was available.

Findley, James S. (Mus. Nat. Hist., U. Kans.) COMPETITION AS A POSSIBLE LIMITING FACTOR IN THE DISTRIBUTION OF MICROTUS. Ecology 35 (3): 418-420, map. July 1954.
Where range of M. pennsylvanicus overlaps range of M. ochrogaster or M. montanus, each species tends to exclude the other from certain habitats. Where only one species occurs, its range of habitats is broader.

Layne, James N., and W. J. Hamilton, Jr. (Dept. Cons., Cornell U.) THE YOUNG OF THE WOODLAND JUMPING MOUSE, NAPAEOZAPUS INSIGNIS INSIGNIS (MILLER). American Midland Naturalist 52 (1): 242-247, illus. July 1954.
Describes new-born young, growth, and development.

Lensink, Calvin J. (U. Alaska.) OCCURRENCE OF MICROTUS XANTHOGNATHUS IN ALASKA. Journal of Mammalogy 35 (2): 259-260. May 1954.
Includes notes on habits and habitat of this poorly known vole.

McCarley, W. H. (Stephen F. Austin St. Coll.) THE ECOLOGICAL DISTRIBUTION OF THE PEROMYSCUS LEUCOPUS SPECIES GROUP IN EASTERN TEXAS. Ecology 35 (3): 375-379, map. July 1954.
Where P. leucopus and P. gossypinus occurred together in a forest tract in eastern Texas, P. leucopus tended to be restricted to the uplands, P. gossypinus to the lowlands.

Priaulx, Arthur W. BREAKING NATURE'S CODE. American Forests 60 (5): 20-22, 52-53, illus. May 1954.
Account of successful efforts to reseed northwestern forest areas from the air. Early attempts failed because rodents, largely Peromyscus, ate the seed. Many commercial and governmental groups worked on the problem and finally succeeded by dropping poisoned grain over area to be seeded and ¼-mile-wide border strip. More recently, tree seed treated with tetramine has provided another solution.

MAMMALS--RODENTS--MISCELLANEOUS--Continued

Reynolds, Hudson G. (Forest & Range Exp. Sta., Ft. Collins, Colo.) SOME INTERRELATIONS OF THE MERRIAM KANGAROO RAT TO VELVET MESQUITE. Journal of Range Management 7 (4): 176-180, illus. July 1954.

Interesting study made at Santa Rita Exp. Range, Ariz. It was known that Dipodomys merriami helps spread mesquite by caching seeds. Since mesquite stands are undesirable because they eliminate perennial grasses, importance of rats in spreading mesquite was studied. It was found that rats rarely carried seeds as much as 200 feet and that other animals, including cattle, were more important seed disseminators because they carried seeds much farther. "Average radius of a home range, considering all sexes and ages, varied from 58 to 80 feet. Hence, on the average, these animals are capable of moving seed to a maximum distance of 160 feet..." An ingenious experiment demonstrated truth of this supposition and reliability of home range data: "Average movement of marked mesquite seed was 47 feet, although distances ranged from 2 to 105 feet." Rats seem to benefit from the grassless condition of mesquite areas, and commonly burrow under mesquite trees. But heavy populations of mesquite were found where there were no rats, and vice versa. The rats may help thicken a stand, but rate of mesquite increase is not likely to be retarded appreciably by removing them. It is wiser to attack mesquite chemically or mechanically. Lack of mesquite and consequent increase of grasses will then lower populations of kangaroo rats.

Schad, G. A. (McGill U.) HELMINTH PARASITES OF MICE IN NORTHEASTERN QUEBEC AND THE COAST OF LABRADOR. Canadian Journal of Zoology 32 (3): 215-224, illus. June 1954.

Author's abstract: "Nineteen helminths are recorded from mice of the families Cricetidae and Zapodidae... The possible synonymy of Quinqueserialis hassalli with Q. quinqueserialis is discussed, Andrya bairdi n. sp. is described, and Catenotaenia Linsdalei is made a synonym of C. dendritica."

Schwartz, Albert. (Charleston Mus., Charleston 16, S. C.) OBSERVATIONS ON THE BIG PINE KEY COTTON RAT. Journal of Mammalogy 35 (2): 260-263. May 1954.

Range (several islands), habitats, abundance, enemies, comparative measurements, taxonomic characteristics.

Thornton, W. A., and Hilmi S. Al-Uthman. (U. Texas.) PATTERN OF DISTRIBUTION OF THE WOOD-MOUSE IN A PART OF THE TEXAS PANHANDLE. Texas Journal of Science 4 (1): 99-101. March 1952.

Marked mice seldom traveled beyond the streamside cottonwood groves in which they lived. Thus populations of different groves and different drainages were fairly well isolated.

MAMMALS--RATTUS AND MUS

Barnett, S. A., and Mary M. Spencer. EXPERIMENTS ON THE FOOD PREFERENCES OF WILD RATS (RATTUS NORVEGICUS BERKENHOUT). Jour. Hygiene 51 (1): 16-34, illus. March 1953. [From Journal of Mammalogy 35 (2).]

Barnett, S. A., and Mary M. Spencer. (Ministry of Agr., London.) FEEDING, SOCIAL BEHAVIOUR AND INTERSPECIFIC COMPETITION IN WILD RATS. Behaviour 3 (3): 229-242, 6 figs. 1951.

A detailed description of feeding behavior and competition between Rattus norvegicus and R. rattus. Decline of feeding due to a new object was marked. The Norway Rats were able to drive out Roof Rats because of larger size of Norways.--David E. Davis.

Barnett, S. A., and Mary M. Spencer. (Ministry of Agr., London.) RESPONSES OF WILD RATS TO OFFENSIVE SMELLS AND TASTES. Brit. J. Anim. Behaviour 1 (1): 32-37, 8 figs. 1953.

Feeding tests showed that aniseed mixed with wheat is a deterrent. N-butyl mercaptan and peppermint oil are deterrents when placed below food. N-butyl mercaptan deters when mixed in food.--David E. Davis.

MAMMALS—RATTUS AND MUS—Continued

Chitty, Dennis, and H. N. Southern, editors. CONTROL OF RATS AND MICE. Oxford University Press, Warwick Square, London, E. C. 4. 3 vols. 824 p., illus. 1954. £5. 5s. net.

Important treatise that brings together a great deal of basic and operational information derived chiefly from work of Bureau of Animal Population, Oxford, under Charles Elton. Volumes 1 and 2 (Chitty, ed.) are on rats. Their 14 papers are by Charles Elton, R. B. Freeman, P. H. Leslie, R. M. Ranson, J. Rzóska, H. V. Thompson, Dennis Chitty, Monica Shorten, A. D. Middleton, E. M. O. Laurie, J. S. Perry, and J. S. Watson. Individual contributions pertain to history of rodent control research by Bureau of Animal Population, properties of poisons, containers for baiting, study of brown rat and its control by poison, reaction of brown rat to environmental changes, consumption by brown rat of plain and poisoned cereal baits, behavior of white rats towards poison baits, stomach analysis of poisoned rats, rural rat control, census of rats and mice in corn-ricks, control in sewers, control of black rat in London, experiments in rat control in Palestine and Sudan.

Volume 3 (Southern, ed.) is on house mice. It consists of 14 papers by H. N. Southern, E. M. O. Laurie, and J. Rzóska. Papers treat ecology, pest status, control other than poisoning, poisoning, feeding activities, preferred foods, prebaiting, behavior in relation to poison bait, use of poisons under varying circumstances, and carbon dioxide fumigation.

Dykstra, Walter W. (US F&WS.) RODENT FILTH IN FOOD. Pest Control 22 (7): 9-10, 12, 14, illus. July 1954.

Examples of prevalence and severity of this contamination, and notes on control of commensal rodents. In discussing control the author states: "Fresh, coarsely-ground, clean yellow cornmeal is a recommended basic ingredient in anticoagulant-type bait formulations. By fortifying it with approximately 20% rolled oats, a small amount of vegetable oil (preferably unrefined corn or peanut oil) and by adding three to five percent confectioners' sugar, its attractiveness to rats and mice is increased about seven times."

Heal, Ralph E. (Nat. Pest Control Assn.) WHICH RODENTICIDE IS BEST? Pest Control 22 (7): 26, 28, 30, 54. July 1954.

Fairly detailed discussion of use of all poisons now used in control of house rats and mice. No answer is given to the question in the title; different circumstances require different poisons.

Jones, John C. (US F&WS.) TIMELY FILMS AND PUBLICATIONS ON RODENT CONTROL. Pest Control 22 (7): 23-24, 52. July 1954.

Lists several publications and numerous films and filmstrips on control of house rats and house mice, and tells where these can be requested, bought, or borrowed.

Pratt, Harry D., and Newell E. Good. (U. S. Public Health Service, Atlanta, Ga.) DISTRIBUTION OF SOME COMMON DOMESTIC RAT ECTOPARASITES IN THE UNITED STATES. Journal of Parasitology 40 (2): 113-129, graph and maps. April 1954.

Rzóska, Julian. (Univ. Coll., Khartoum.) BAIT SHYNESS, A STUDY IN RAT BEHAVIOUR. Brit. J. Anim. Behav. 1 (4): 128-135. 1953.

Experiments on white rats showed that bait-shyness developed irregularly, was due primarily to bait rather than poison, that some rats remained shy for a year, and that wild Norway Rats were superior to white rats in acuity of senses and in caution.—D. E. Davis.

Smith, William W. (U. S. Public Health Service, Newton, Ga.) THE HOUSE MOUSE AND MURINE TYPHUS IN MISSISSIPPI. Public Health Reports 69 (6): 591-593, map. June 1954.

Only one positive sample was obtained in the study. "...could indicate that the house mouse is more likely to be infected where its range is overlapped by that of infected domestic rats. The importance of the house mouse in the epidemiology of murine typhus in Mississippi appears to be negligible at present."

MAMMALS--RATTUS AND MUS--Continued

Strecker, Robert L. (Miami U., Oxford, Ohio.) REGULATORY MECHANISMS IN HOUSE-MOUSE POPULATIONS: THE EFFECT OF LIMITED FOOD SUPPLY ON AN UNCONFINED POPULATION. Ecology 35 (2): 249-253, illus. April 1954.
Two colonies were established in rooms of buildings with channels of egress. For one colony there was unlimited food supply. Egress from this colony was slow. For the other colony the amount of food was a constant, limited amount. As this colony grew, approaching food limits, egress occurred at a high rate. General composition and reproductive activity were essentially the same in both colonies.--L. F. Stickel.

Tarzwell, C. M., and others. THE RESISTANCE OF CONSTRUCTION MATERIALS TO PENETRATION BY RATS. Public Health Monograph no. 11. (Public Health Service Publication no. 277.) 16 p., illus. 1953. 20¢ from Superintendent of Documents. [From abstract in Public Health Reports 68 (8).]
Report of severe experimental tests with a variety of materials.

Thompson, Harry V. (Ministry of Agr., Surrey, Eng.) EXPERIMENTAL LIVE-TRAPPING OF RATS, WITH OBSERVATIONS ON THEIR BEHAVIOUR. Brit. J. Anim. Behav. 1 (3): 96-111, 1 fig. 1953.
Detailed descriptions of behavior of Norway Rats show that some rats consistently avoid traps, some learn to get out, and only a fraction of the population is captured.--David E. Davis.

MAMMALS--SCIURIDS

Brenneman, William S. (Muskegon Heights, Mich.) TREE DAMAGE BY SQUIRRELS: SILVICULTURALLY SIGNIFICANT? Journal of Forestry 52 (8): 604. Aug. 1954.
Sugar maple is a minor component of hardwood forest on stabilized dunes in Muskegon Co., Mich. The author maintains that fox and gray squirrels, especially gray, are responsible. "...nearly all sapling and pole sized sugar maples have been barked by squirrels. Most of the trees subsequently die. Even the tops of large mature maples are being attacked. ...most of the damage is done in January and February. Species other than sugar maple aren't attacked. The squirrels do not seem to be starving and attack the maples regardless of other food supplies... Damage varies from winter to winter." Many of the squirrels are black grays, which are protected by law; hunting pressure in the area apparently is light.

Christisen, Donald M. (Mo. Cons. Comm.) TOO YOUNG TO DIE. Missouri Conservationist 15 (5): 4-5, illus. May 1954.
The Mo. squirrel season ran from May 30 to Oct. 31 and from Nov. 10-30. Original research data are given to show that the early part of the season caused too great a loss of mothers and young. The season has been changed to open on July 1, which is still relatively early. The change is expected to result in a 7.5% increase in the annual bag.

Cook, David B. (Cooxrox Forest, Stephentown Center, N. Y.) SUSCEPTIBILITY OF LARCH TO RED SQUIRREL DAMAGE. Journal of Forestry 52 (7): 491-492, illus. July 1954.
Red squirrels may do severe damage to larch by trimming off twigs. They prefer European larch, especially the Scotch race, but let Japanese and Dahurian larches alone. "This emphasizes the necessity for great care in the selection of species and races of larch for planting in the Northeast."

Kilham, Lawrence. (8302 Garfield St., Bethesda, Md.) TERRITORIAL BEHAVIOR OF RED SQUIRREL. Journal of Mammalogy 35 (2): 252-253. May 1954.
Significant observations on use and defense of territories.

MAMMALS--SCIURIDS--Continued

Layne, James N. (Dept. Cons., Cornell U.) THE BIOLOGY OF THE RED SQUIRREL, TAMIASCIURUS HUDSONICUS LOQUAX (BANGS), IN CENTRAL NEW YORK. Ecological Monographs 24 (3): 227-267, illus. July 1954.

Long, detailed report of local life history studies. Findings cannot be summarized briefly. Major subjects discussed are: weights and measurements, pelage changes, habitats, numbers, food habits and seasonal changes in them, activity, age classes and sex ratios, gross seasonal changes in reproductive tracts, breeding season, mating behavior, fecundity, growth and development, care and behavior of young, nests, sizes of and changes in home ranges, homing, territoriality, deformities, longevity and mortality, and parasites. The extensive summary appears to provide a good digest of the paper.

Moran, Richard J. (So. Ill. U.) SQUIRREL MANAGEMENT IN SOUTHERN ILLINOIS. Illinois Wildlife 8 (4): 5-6, illus. Sept. 1953.

Studies at Crab Orchard Refuge demonstrated that too many pregnant and lactating females were killed when hunting was done in Sept. Of adult female fox squirrels, 70% were lactating in Sept. 1951, and 32% in Sept. 1952. Similar figures for grays were 68% and 42%. A season opening Oct. 1 would save many sucklings. Hunters killed a squirrel per 2.2 acres in 1952, but this represented harvest of only 10-14% of the population. Squirrels on area had been protected 12 years before 1951, when 340 were shot. Rearing success was high in 1952 (figures are given) and kill was 548. Thus factors other than hunting limited the population. Planting of nut trees and preservation of at least 2 den trees per acre are recommended to improve habitat.

Robinson, D. J., and I. McT. Cowan. (U. Brit. Col.) AN INTRODUCED POPULATION OF THE GRAY SQUIRREL (SCIURUS CAROLINENSIS GMELIN) IN BRITISH COLUMBIA. Canadian Journal of Zoology 32 (3): 261-282, map and graph. June 1954.

Authors' abstract: "A population of gray squirrel...introduced into an isolated forest and park area of 1000 acres [at Vancouver] is the subject of the study. The squirrels have established themselves in the deciduous and mixed forest areas and in these areas they seem to prevail over the native chickaree... even though the chickaree is physically dominant. The gray squirrel has not adapted itself to new food sources but has merely narrowed its choice until two species, Acer circinatum and A. macrophyllum, of a genus used on its native range dominate the annual diet. Black color predominated over grey (6.5 to 1), the sex ratio was 1 male to 0.645 females, the mean litter size at weaning 1.5. Under these conditions the suitable range is fully stocked and the population is stable. Males roamed over territories of at least 50 acres while females remained within areas of 5 to 15 acres. Thus with polygamy the rule, each male had a theoretical chance of mating with any female. Physical dominance seemed to govern the male actually mating with an oestrous female but the same male did not prevail in each mating observed." Prebreeding density of 0.69 squirrels per acre rose to 0.88 in autumn. First breeding period was in March-April, second in June-July. Males were sexually active Jan.-August. Territoriality was limited to defense of nest tree by female. Ranges of males were no larger than those of females in winter. There was little predation on birds' nests by either squirrel species.

MAMMALS--BEAVER

Adams, Arthur Kinney. SOME PHYSICO-CHEMICAL EFFECTS OF BEAVER DAMS UPON MICHIGAN TROUT STREAMS IN THE WATERSMEET AREA. Ph.D. thesis, U. Michigan. 332 p. 1954. [From long abstract in Dissertation Abstracts 14 (4).]

Detailed study of water temperatures, oxygen content, and other factors affecting trout in and near beaver impoundments. Comparisons are made with streams that lacked dams. "The chemical conditions in the impoundments unsatisfactory for brook trout seem to encourage competitive fishes such as creek chubs and white suckers to become dominant. Native brook trout proved surprisingly resistant to temperatures above 80°F. for short periods of time in field experiments... The heating of tributaries was more consequential down-stream than in the ponds themselves..." "...discouragement or removal of beaver on marginal trout waters may be warranted when stream survey procedures include an appraisal of beaver-trout relationships."

MAMMALS--BEAVER--Continued

Hart, John D. (Colo. Game Dept.) THE EMBATTLED BEAVER. Colorado Conservation 3 (4): 6-10, illus. July-Aug. 1954.
Traces legal and conservation history of beaver in Colo. from earliest time to the present. Once near extermination, beavers increased to pest proportions. Irate landowners then forced through a law requiring the state to remove dams and to trap beavers in such numbers and as directed by the landowner, and within 24 hours of notice. Also the landowner was to get half the gross proceeds from pelts. This remarkable law still holds. Departmental trappers are kept busy on private lands. Beaver on higher, public lands are not harvested, but keep repopulating lower lands where they are not wanted. Extermination is no longer a threat, but good management is impossible under present laws.

Rawley, Edwin V. (Utah Dept. Game.) UTAH BEAVER TRANSPLANTING MANUAL. Utah State Department of Fish and Game, Departmental Information Bulletin no. 12. 1-15 p., illus. May 1954.
Much information on methods of capturing and handling, taking and recording data, and selecting release sites.

Robertson, Ralph A., and Albert R. Shadle. (U. Buffalo.) OSTEOLOGIC CRITERIA OF AGE IN BEAVERS. Journal of Mammalogy 35 (2): 197-203, graph. May 1954.
Authors' summary: "The materials used were three new-born beaver kits, the bones of forty-eight beavers, three skulls of other beavers, the carcass of one female beaver, and nine radiographs of two 15-month-old beavers. Molariform tooth characteristics are a valuable factor in determining the ages of beavers. Cranial measurements together with cranial characteristics and conditions are useful in age determination of beavers. The sacrum, os innominatum, tibia, and scapula showed high positive correlations between skeletal characteristics and dimensions, and they are believed to be useful in age determination... Epiphyseal consolidation in the beaver appears to be completed sometime during the fourth year of...life. Growth curves are useful in approximating the ages of specimens..." [See also Cook & Maunton, WR 76: 37.]

Stegeman, LeRoy C. (St. U. of N. Y., Syracuse.) THE PRODUCTION OF ASPEN AND ITS UTILIZATION BY BEAVER ON THE HUNTINGTON FOREST. Journal of Wildlife Management 18 (3): 348-358. July 1954.
Intensive, quantitative study made in Adirondacks, N. Y. Discusses annual rate of growth of aspen by size classes, amount used by beaver, and aspen rotation period best for beaver. Small aspen are most used, and most favorable rotation period would be about 10 years. It is shown that value of beaver pelts will justify devoting tracts near beaver habitat to aspen. And value of beaver pelts should be at least equaled by value of grouse, deer, hare, and fox using aspen areas and fish, waterfowl, and various fur animals using beaver ponds.

Yeager, Lee E. (Colo. A & M Coll.) BEAVER MISMANAGEMENT. Colorado Conservation 3 (4): 11-15, illus. July-Aug. 1954.
See abstract of Hart's article for background. Beavers of the Colo. high country cannot be harvested properly because of inadequate laws. Overpopulations became common by 1940's. Colonies exhausted their sites and abandoned or starved. Dams washed out by hundreds, dumping tons of gravel and other debris into streams and over meadows. Streams cut deeper, water levels fell, and tremendous acreages of habitat for many kinds of wildlife and fish were lost. This situation exists to date. Change of law is sought--fruitlessly so far--but in anticipation of change a very intensive survey of populations and habitats is being made.

MAMMALS—MUSKRAT AND NUTRIA

Bednarik, Karl. (Ohio Div. Wildl.) THIS MYSTERIOUS MUSKRAT DISEASE. Ohio Conservation Bulletin 18 (7): 21, illus. July 1954.

An important factor in muskrat fluctuations in Lake Erie marshes is Errington's disease (hemorrhagic disease). On one marsh the epizootic reached its peak in Dec., killing several hundred muskrats. Houses are thought to remain infectious. The disease is worst in marshes where houses persist for several years. It is far less common where houses are destroyed annually by wave action. Errington reported some favorable results from artificial destruction of houses. Cause and method of spread of the disease are unknown. Symptoms are described. Other animals are not believed to catch this disease.

Swank, Wendell G., and George A. Petrides. (Ariz. Game Comm.) ESTABLISHMENT AND FOOD HABITS OF THE NUTRIA IN TEXAS. Ecology 35 (2): 172-176, illus. April 1954.

From summary: "Prior to August, 1950, the nutria was introduced into at least 22 counties in Texas. A survey of their food habits in freshwater impoundments indicates that they readily eat cattail, giant cutgrass, arrowhead, panic-grass, white water lily, and pickerel weed. To a lesser extent rice cutgrass was eaten. Arrow arum, water shield, American lotus, and smartweed... were not used as food. The animals tend to 'clear cut' almost all stems in a small area, thereby making openings in an otherwise vegetation-choked marsh. Little evidence of burrowing was noted. The nutrias seemed to use open 'beds' or 'forms' for their homes. The eventual economic desirability of this rodent, especially inland in agricultural areas, is debatable." Reports are cited of nutrias raiding crops and injuring levees to a serious extent. [Fur value of nutria is now low and La. trappers are said to be killing nutrias just to get rid of them.]

Wragg, L. E. (Madison, Wis.) THE EFFECT OF D.D.T. AND OIL ON MUSKRATS. Canadian Field-Naturalist 68 (1): 11-13, illus. Jan.-March 1954.

Muskrats of Dundas Marsh, near Hamilton, Ont., decreased notably after part of marsh was sprayed with 3% solution of DDT in fuel oil at rate of 1 gallon per acre. Habitat continued to seem excellent, and so few other animals were killed that it seemed unlikely that DDT was responsible for loss of muskrats. Experiments were then made by adding 1, 2, or 4 c.c. of fuel oil to small tanks of water containing muskrats. The animals floated lower in the water, tried to escape, became wet and chilled, and skin around the eyes became irritated. These effects were strongest with 4 c.c. of oil, but appeared to some extent with 1 c.c. They reappeared after a muskrat was allowed to dry for 4 days and then placed in clean water. It is evident that a small amount of oil can make a water area highly unsuitable for muskrats.

MAMMALS—FURBEARERS—GENERAL

Anonymous. 1954 BEAVER [AND OTTER] HARVEST. New York State Conservationist 8 (6): 30. June-July 1954.

Catch in N. Y. is reported by counties for both species. Totals were 5826 beaver and 215 otter. Lower price of beaver fur caused trapping pressure to drop, but harvest is thought to have been adequate except in a few locations. "In certain counties an open season for otter ran concurrently with the beaver season. Otter trapping as such is very limited, and most of the otter were taken in traps set for beaver."

Ashbrook, Frank G. (US F&WS.) ANNUAL FUR CATCH OF THE UNITED STATES, 1953-54. U. S. Fish & Wildlife Service, Wildlife Leaflet 362. 1-24 p. July 1954.

A table is given for each state that is able to supply data on its fur catches. Tables show catch by species for each year since 1948. Footnotes indicate nature of data: estimates, tag reports, etc. The introduction states that the U. S. raw fur trade is still weak. Most trappers have quit their trade because of low pelt prices and Indians and Eskimos in Alaska are suffering real privation. With few exceptions, annual fur takes reported by chief fur-producing states are still declining.

MAMMALS—FURBEARERS—GENERAL—Continued

Oregon. FUR CATCH REPORT / 1953-54 TRAPPING SEASON. Oregon State Game Commission Bulletin 9 (7): 7. July 1954.
Table showing catch of 10 fur species in each county, with average pelt price and total value per county and for state.

MAMMALS—BEARS

Resner, O. L. (Wash. St. Game Dept.) DAMAGE TO CONIFERS BY BEAR. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm'rs., June 1-3, 1953. p. 109-111. [1954.]
This type of damage in Wash. became serious in 1951. Bears stripped bark and ate cambium. Injuries varied from small patches to complete girdling and ranged from ground to 50 feet up. Damage was serious in 3 counties of Olympic Peninsula. All conifers were attacked, but Douglas fir was preferred. Damage was worst in relatively open stands. There 50% to 90% of trees were killed or hurt in various areas. Bears were outlawed on the Peninsula and hunters and trappers were sent after them. In 1952, 237 bears were killed in the region, and 40% to 70% decrease in damage was reported from one area. Cause of outbreak is thought to have been overpopulation resulting in food shortage. Stomach contents of 44 bears (April-August) are recorded in table. Grasses and leaves were found in 37 and cambium was found in 10. "Meat" was found in 3, fawn in 2. Other foods were fruits and insects, found in 10 and 8.

Svihla, Arthur, and Howard S. Bowman. (U. Wash., Seattle.) HIBERNATION IN THE AMERICAN BLACK BEAR. American Midland Naturalist 52 (1): 248-252. July 1954.
Discusses observations and opinions of other authors and reports work with a dormant young black bear. Posture and responses are described. Respiratory rate was 2 to 3 times a minute. Body temperature was about 95° F. Skin temperature was 40° F. when temperature at surface of hair was 32°. Temperature in nest directly under bear averaged 40-50° F. when surrounding air was 18° F. Under Nembutal, body temperature dropped to 71°. Bear lost 25% of weight Nov.-March. The authors believe bears should be said to hibernate, and propose the terms "partial dormancy or torpor," which applies to bears, and "complete dormancy or torpor," which applies to ground squirrels and other true hibernators.

MAMMALS—RACCOON AND RINGTAIL

Cabalka, James Lee. RESTING HABITS OF THE RACCOON, PROCYON LOTOR HIRTUS N. AND G., IN CENTRAL IOWA. M.S. thesis, Iowa State College. 35 p. 1952.
Prof. G. O. Hendrickson informs us that the term "Resting" in the title refers to denning, loafing, sleeping, and related activities.

Cabalka, J. L., R. R. Costa, and G. O. Hendrickson. (Iowa St. Coll.) ECOLOGY OF THE RACCOON IN CENTRAL IOWA. Proceedings Iowa Academy of Science 60: 616-620. 1953.
Summarizes parts of 2 theses: Costa's on food habits, Cabalka's on resting habits. Seasonal food habits (spring; summer, autumn) are reported on basis of 300 scats. Representation of foods was essentially the same as in 1939, when population was low instead of high. Of 17 farmers interviewed by Costa, 12 reported no losses to raccoons, 4 reported loss of sweet corn and molestation of poultry, 1 reported significant damage to sweet corn. Tree and other dens are described from Cabalka's work, and some early fall resting sites are listed. "Late in autumn drops of 15 degrees F., or more, sent the raccoons to denning cover. The extent of winter out-of-den activity varied with raising temperatures and seasonal progress. Generally, an increase of 20 degrees F., or more, about 10 to 35 degrees F. in one to three days of winter prompted noticeable outside activity. Snow late in fall reduced raccoon activity much more than later snow."

MAMMALS--RACCOON AND RINGTAIL--Continued

Dellinger, George Paul. BREEDING SEASON, PRODUCTIVITY, AND POPULATION TRENDS OF RACCOONS IN MISSOURI. M. A. thesis, University of Missouri. v + 86 p., graphs. 1954.

Most mating was in Feb. Except for late-born females, onset of estrus was same for parous and nonparous females. If a litter is lost early, there may be second litter. Best criterion of juvenile males is lack of porous bone at basal end of baculum. Weight of baculum is also useful. Juvenile males may be recognized in fall because penis can be extruded no more than half way. For same purpose, body weight is about 90% accurate. It is less useful for females. Placental scars are not reliable for more than 1 season. Enlarged teats identify a parous female for at least 2 seasons. Raccoons are still high and probably still increasing in Mo. Number harvested has increased 300% since 1939. Proportion of females has increased irregularly from 36% to 52%. Only 5-14% of females were nonparous. Proportion of juveniles among males was 56-69% in past 6 years. Average litter size (from scars) was 3.5-3.6 in last 3 years. Average number of young per adult female was 3.1. Juveniles were most frequently taken in first part of season. Proportion of adult males in harvest rose in early Jan., probably because of onset of sexual activity. Pelts at fur houses do not represent random samples of sex and age groups.

MAMMALS--MUSTELIDS

Gudmundsson, Finnur. BIRD PROTECTION IN ICELAND. Bull. Internat. Comm. Bird Protection, no. 6. 153-160 p. [From Journal of Mammalogy 35 (2).]

"Predation by introduced Mustela vison."

MAMMALS--DOGS, WOLVES, FOXES

Douglas, L. H. THE COYOTE--AN ANOMALY. Amer. Cattle Prod., April 1954, p. 14, 16. [From Journal of Range Management 7 (4).]

Graham, R. M. (Kenya, S. Africa.) COYOTE CONTROL. Journal of Forestry 52 (6): 451. June 1954.

"There is always a danger that domestic animals, or animals other than those which it is necessary to kill, may pick up poison through the scattering of vomitus. This danger can be very considerably reduced if the poison is wrapped up in a couple of layers of thin paper or something of that nature, when it is inserted into the bait. The object of this is, of course, to allow the poison to stay inside the animal for some time before it starts to act. By then it will usually be impossible for the victim to vomit it up. In this country hyaenas will usually get rid of poisoned baits as soon as they feel the poison beginning to act. You may be well aware of this old dodge, but I have never seen it mentioned in print." Copied completely.

Schenkel, R. (Zoologischen Garten, Basel.) AUSDRUCKS-STUDIEN ON WOLFEN; GEFANGENSCHAFTS-BEOBACHTUNGEN. Behaviour 1 (2): 81-129, 57 figs. 1947.

Wolves (species not stated) in captivity live in packs and have a definite social rank organization. Facial and body expressions are described and figured in great detail. A hierarchy of expressions occurs with the olfactory followed by more complex combinations of facial and body movements.--D. E. Davis.

MAMMALS--CATS

Errington, Paul L. (Iowa St. Coll.) ON THE CONSERVATION OF THE LYNX IN SCANDINAVIA. Journal of Mammalogy 35 (2): 254-255. May 1954.

The lynx has been exterminated in most parts of Europe but a few hundred remain in Norway and Sweden. Efforts are being made to keep the population at a safe level. It is being suggested that what slight depredations occur be paid for from public funds in the interest of preserving the species as part of the native fauna.

MAMMALS-CATS--Continued

Haltenorth, Th. THE WILD CATS OF THE OLD WORLD. A REVIEW OF THE SUBGENUS FELIS. Akademische Verlagsgesellschaft, Leipzig. 166 p., 115 figs., 4 maps. 1953. [From informative review by R. L. Peterson, Journal of Mammalogy 35 (2).]
In German. Presents new classification of genera of Felidae, with more genera recognized than in some other recent works. Lynx, for example, is not only considered distinct from Felis, but is placed in a different subfamily. The bulk of the paper is devoted to a detailed study of the subgenus Felis. Five species with many races are recognized in the subgenus. "The origin, phylogeny, post glacial dispersal, geographic and other variations of this group are discussed. Close correlations of speciation with the climatic regions are pointed out." Peterson's review provides more information.

Heald, Weldon F. THE CASE OF THE COUGAR. Nature Magazine 46 (1): 8-12, 50, illus. Jan. 1953.
Speaking from a considerable background of livestock ranching in southeastern Arizona, where cougars are common, the author maintains that the cougar has been greatly maligned, and that it is by no means the colt, calf, and deer killer that it is commonly pictured as being. It will kill and eat these animals, of course, but it does so far more rarely than we are usually given to think. Ranchers in good cougar country commonly go years without losses. The big cats feed on many small animals--they do not live solely on game and livestock. Furthermore they are an outstandingly interesting part of our wildlife.

Johnson, Murray L., and Leo K. Couch. (Mus. Nat. Hist., Coll. Puget Sound.) DETERMINATION OF THE ABUNDANCE OF COUGAR. Journal of Mammalogy 35 (2): 255-256. May 1954.
Consideration of life history data indicates that "we will have each year before the winter hunting season a minimum number of cougars in the area that is three times the number killed... In addition, assuming longevity of ten years, the natural attrition of 10 per cent of the entire population must be added." Therefore, letting K= sustained yearly kill, and N= minimum estimate of population: N= 3K + 3K/10. Figures used may need adjustment to local conditions. Applying the formula to the Olympic Peninsula of Washington, where annual kill runs about 63, the minimum population is estimated at 208.

MAMMALS--BIG GAME--GENERAL

Crane, Harold S. (Utah Dept. Game.) CONTROLLED HUNTS FOR BETTER BIG GAME MANAGEMENT. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm'rs., June 1-3, 1953. p. 205-208. [1954.]
Describes the numerous kinds of special seasons and special hunts that are used in Utah to keep herds in balance with their ranges and to reduce crop damage. The system has great flexibility and seems to be highly satisfactory.

Mace, R. U. (Ore. Game Comm.) 1953 BIG GAME HARVEST. Oregon State Game Commission Bulletin 9 (6): 3-4, 6-7. June 1954.
Discussion of deer, elk, and antelope harvests. Tables and graphs show deer and elk hunting statistics by county. Totals were 105,601 deer, 4,145 elk, and 181 antelope. The 2 previous winters favored good survival, so after hard winters kills may not be so high.

MAMMALS--HOOFED (except deer)

Altman, Margaret. (Hampton Inst., Va.) SOCIAL BEHAVIOR OF ELK, CERVUS CANADENSIS NELSONI, IN THE JACKSON HOLE AREA OF WYOMING. Behaviour 4 (2): 116-143, 1 fig. 1952.
By stalking and using blinds, the daily routines of elk were observed both inside and outside the Wildlife Park. Elk tend to break through a disturbance rather than flee from it. The animals divide up into groups of bulls and of cows and calves. A dominance organization is maintained with little actual combat. In Aug. and Sept., during the velvet-rubbing state, bull groups dissolve and individuals join the cows. In winter, before actual migration, sub-

MAMMALS—HOOFED (except deer)—Continued

groups form which may divide into units of 3-5 elk. These later begin migrating along streams to higher areas. In migration, calving tends to retard the cows, permitting bulls and non-breeding cows to reach higher altitudes. In some cases groups of calves are tended by several cows. The cow drives her yearling calf away. In the summer pasture, abundant feed permits play, bathing and wallowing. Group formations are irregular; sometimes several hundred elk are together, at other times only a few. The elk were bold and hard to frighten. However, in summer ranges with little food the behavior was very different. No play was seen and the feeding routine was interrupted only by a period for rumination around noon. The elk were easily frightened. Mature females led the groups.—David E. Davis.

Arizona. [JAVELINA WEIGHTS.] Arizona Wildlife-Sportsman 25 (5): 6-7. May 1954.
Much information on exceptionally high javelina weights is given in letters to the editor in the issue cited and preceding issues. The information seems to be factual and reliable as far as it goes, despite marked disagreements between writers. There is also disagreement as to whether these animals are decreasing in Ariz.

Edwards, R. Y. (B. C. Forest Service, Victoria.) COMPARISON OF AN AERIAL AND GROUND CENSUS OF MOOSE. Journal of Wildlife Management 18 (3): 403-404. July 1954.
Both methods were tested in Wells Gray Park, B. C., in March 1952. Flat terrain and open, leafless vegetation were favorable to counts. Techniques are described. Efforts were made to get high accuracy. Final estimates were about 2000 (ground count) and 1720 (aerial). The difference was considered disappointing. Author believes that eye fatigue of aerial observers is important, especially for observer using a narrow window, and that aerial counts might be corrected by increasing them by 22%. The correction was derived from differences in counts of observers in different positions in plane. This correction brings ground and aerial counts close together.

Glover, R. THE MUSKOX (OVIBOS MOSCHATUS). Oryx 2 (2): 76-86. Aug. 1953. [From Journal of Mammalogy 35 (2).]

Kohls, Glen M., and N. J. Kramis. (Rocky Mt. Lab., Hamilton, Mont.) TICK PARALYSIS IN THE AMERICAN BUFFALO, BISON BISON (LINN.). Northwest Science 26 (2): 61-64, illus. June 1952.
In two herds in western Mont. in April 1951.—Neil Hotchkiss.

Tener, J. S. A PRELIMINARY STUDY OF THE MUSK-OXEN OF FOSHEIM PENINSULA, ELLESMERE ISLAND, N.W.T. Canadian Wildlife Service, Wildlife Management Bulletin, series 1, no. 9. 1-34 p. + 7 figs. Feb. 1954.
Study of factors affecting population was made April-August 1951. Subjects discussed include herd composition, sex and age ratios, mating and calving, fighting, protection of females and young, single males, movements from summer to winter ranges, range botany, feeding habits, and wolf predation. Cows outnumbered bulls 2 to 1. Herds often contained more than one adult bull, but not after breeding season began. Fighting for cows began in June. Breeding was in July and August, calving from April possibly to June. Ratio of calves to cows in June was 1:5.1. Ratio of calves to all others was about 1:10. Cows probably breed only in alternate years. Production is low and survival is poor, about 38% of calves reaching adult age. Wolves may cause significant loss of calves, and they take a good many single males, but the loss of these males is of little population importance. Winter and summer musk-ox ranges are described. They are close together, so little travel is necessary. Grasses are preferred food. A theory is offered for control of breeding cycle by variations in light conditions. The paper includes 6 tables and 52 references.

MAMMALS—DEER

Blaisdell, James A. (Calif. Dept. Game.) A PROGRESS REPORT ON THE DOYLE DEER HERD. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm's., June 1-3, 1953. p. 132-139, map. [1954.]

Much information on history, status, food habits, and range conditions of this Calif.-Nev. herd. Winter range is shared with livestock. Bitterbrush, the preferred and most beneficial food, is nearly browsed out. Deer starve to death with stomachs full of sagebrush; studies are under way to find out why, for sage is supposed to be nutritious. Juniper, an important food elsewhere, is little used here. Counts of corpora lutea and embryos prove that reproductive potential is as high as anywhere, but embryo counts drop during hard winters, presumably because of resorption owing to hardship. Fawn losses are high during hard winters. No fawns and few yearlings breed. Diseases and parasites are not a factor. The population was temporarily low in 1953 and condition of deer and range improved, but the herd will soon be too large again. Unfortunately, Calif. law forbids shooting of antlerless deer, so herd cannot be controlled properly, but must go through starvation cycles. Experiments with range improvement are being made and efforts are being made to acquire Nev. wintering grounds. Also needed are ways of estimating population so all work will not have to be done merely with trends.

Dasmann, Raymond F. (MVZ, U. Calif., Berkeley.) FACTORS INFLUENCING MOVEMENT OF NON-MIGRATORY DEER. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm's., June 1-3, 1953. p. 112-116. [1954.]

Home range study of marked deer in chaparral of Lake Co., Calif. Home ranges of does and yearlings averaged 700 yards across. Ranges of young adult bucks averaged 850 yards. Those of older bucks averaged 900 yards with maximum of about 1,300. Thus area of 360 acres would be maximal. An area is shared by various deer--no territoriality was noted. A deer spends most time near a center of activity where both feeding and bedding grounds are available. A range includes both north and south slopes of a ridge, but may center anywhere from top to bottom of ridge. Travels from home range may be caused by breeding, dispersal of young, or unexplained wandering. These are discussed. Some excursions are followed by return to range. Ninety percent of records are for deer within 500 yards of their home range centers. Only about 1% of records are for deer over 1,000 yards from their range centers. Weather causes little travel in the area. Lack of sufficient quantity of food causes travel. But poor quality of food does not cause travel, even when lethal malnutrition occurs. Disturbance, as by hunters and dogs, does not cause deer to leave their home ranges if good cover is present; the deer circle about and seek cover within range. Reduction of a population from 90 to 40 resulted in no observable differences in range size or travels. Thus deer strongly tend to remain in a small familiar area.

Illige, Benis J. (Ariz. Game Comm.) PRODUCTIVITY DATA OF ARIZONA MULE DEER. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm's., June 1-3, 1953. p. 117-127, graphs. [1954.]

Data presented in 6 graphs and 6 tables show that the percentage of fawns is considerably lower on South Kaibab than on North Kaibab. Also, does average older and heavier on North Kaibab. Data on ovulation rate and breeding success are similar for both populations. It is believed that fawn mortality is higher on South Kaibab for unknown reasons. The ranges are known to differ. Author's conclusions: "1. Ovulation rate for the North and South Kaibab doe herds are significantly [not greatly] different only for the mature (3-7 year old) age class. In this group the South Kaibab doe herd has the greater ovulation rate. 2. The age composition of the North and South Kaibab doe herd as exemplified by the hunter kill portrays an older averaged age herd for the North Kaibab. 3. Weights of sample specimens are not [because of small samples] significantly different for the two herds, although the average weight per age class in the North Kaibab is ten pounds greater. 4. No correlation exists for weights per age class and age, ovulation rate or percent breeding success between the two herds."

MAMMALS--DEER--Continued

Jones, Fred L. (Calif. Dept. Game.) AGEING THE INYO MULE DEER. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm'rs., June 1-3, 1953. p. 209-219. [1954.]

Presents detailed system of determining age by teeth. Individual variation is fully considered, both upper and lower jaws are utilized, and characteristics of both cleaned and intact jaws are described. This appears to be a paper that everyone concerned with the subject should see. Eighteen references.

Lauckhart, J. Burton. (Wash. St. Game Dept.) FUTURE OBJECTIVES OF BIG GAME MANAGEMENT. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm'rs., June 1-3, 1953. p. 87-92, graph. [1954.]

The chief and undisputed point of this paper is that deer herds should be shot heavily enough to keep them below carrying capacity of their range so they will reproduce rapidly and provide lots of hunting. If a herd is allowed to reach carrying capacity the range is damaged, reproduction is low, and survival is poor. When a herd is at range capacity we can safely increase the take 100% by killing as many does as bucks and then probably get another 100% increase from better survival of all deer. The author makes the stimulating suggestion that herds generally are at range capacity. If the population is low and no range damage is apparent, this simply shows that we are unable to evaluate carrying capacity. He goes so far as to say, "Generally, all ranges carry a capacity herd of deer at all times. To my knowledge there are few proven records indicating that over-hunting caused the destruction or even serious reduction of any deer herd." This may be true of well established, legally hunted herds. But there is no doubt that deer of many areas were completely wiped out by unrestricted hunting, and that herds in several states are still becoming established and are well below capacity in numerous localities. The author makes no such qualification.

Longhurst, William M. (U. Calif., Davis.) THE FECAL PELLET GROUP DEPOSITION RATE OF DOMESTIC SHEEP. Journal of Wildlife Management 18 (3): 418-419. July 1954.

Deer and sheep pellets may be hard to distinguish. Rate of deposition by sheep was studied so pellets could be prorated properly for land where both deer and sheep ranged. Results are given. The rate was higher when sheep were on green feed. The same condition seems to prevail with deer, as winter counts for penned deer averaged 11.2 groups per day and summer counts 13.7 per day.

Muncy, Robert J. THE STATUS OF THE WHITE-TAILED DEER IN BATH COUNTY, VIRGINIA. M.S. thesis, Virginia Polytechnic Institute. 103 p. June 1954.

Detailed study of deer herd and range conditions. On areas of higher population, browse studies indicated lower quantity and lower quality of browse species available and greater utilization of these species than on areas of lower population. Comparison tests were made of average body sizes of bucks from areas of higher population with sizes of those from areas of lower population.--V. Schultz.

Pietsch, Lysle R. (Ill. Dept. Cons.) WHITE-TAILED DEER POPULATIONS IN ILLINOIS. Illinois Natural History Survey (Urbana), Biological Notes no. 34. 1-22 p., illus. June 1954.

Report of study made 1946-51. Among topics discussed are early history in state, virtual extermination, restocking, present distribution, concentration areas, live-trapping records, populations, sex and age ratios, weights, movements, known causes of mortality, condition of herds, and management. Deer now occur in most counties but there are fair numbers only in southern and north-central areas of state. Many areas can support far larger populations. Over-populations are known from only 2 small areas. Trapping did not solve over-population problems but did help appease farmers. Experiments indicated that repellents were only partially effective and had to be used too often and too extensively to be practical for protecting field crops. Deer hunting has not been permitted in Ill. but should be considered now for the northcentral herd and at some future time for the southern herd.

MAMMALS--DEER--Continued

Ramsey, Bob, and Eugene Walker. (Texas Game Comm.) TAKE 'EM OR LEAVE 'EM. Texas Game and Fish 12 (7): 4-6, 20-21, 27-28, illus. June 1954.
Report on Texas' first antlerless deer hunt (in Mason and Gillespie counties) and why it was necessary to reduce the herds. According to the new law that makes such hunts possible, landowners and counties can veto this hunting.

Smith, A. D. (Utah St. Agr. Coll.) HOW MUCH WATER DOES A DEER DRINK? Utah Fish and Game Bulletin 10 (9): 1, 8. April. 1954.
Mule deer in paddocks drank an average of 1.66 quarts per day in summer, usually from 1 to 1.5 quarts. "During two periods more than three quarts daily were used. By contrast while the deer were in the spruce-fir type the daily intake was less than a half quart daily." No explanation is evident, but the higher values were observed during 1952, which was particularly dry. On the same sites sheep averaged 2.73 quarts with a high of 4 and a low of less than 1 quart. As with deer, lowest consumption was in spruce-fir type.

Taber, Richard D. (School of Forestry, U. Calif., Berkeley.) PRODUCTION, MORTALITY, AND YIELD OF BLACK-TAILED DEER ON CHAPARRAL RANGE. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm'rs., June 1-3, 1953. p. 128-131. [1954.]
Comparisons were made in Lake Co., Calif., of conditions for deer in opened brush (mixture of brushy and herbaceous stands), heavy brush, and burns having sprouts and seedlings of brush. Fawn production, which directly reflected ovulation rate, was highest in opened brush and least in heavy brush (147 as opposed to less than 85 fawns per 100 adult does). A hot dry summer followed by a hard winter causes heavy losses. When mortality rates for opened and heavy brush are compared, it is found that mortality is a little lower for each age group in heavy brush, a reflection of lower reproductive rate there. An exception is high mortality rate of legal bucks in opened brush; these bucks are more easily seen and shot. Crippling loss is high, about 42% in opened brush and at least 50% in heavy brush. Summer populations are 50-90 per square mile in opened brush and between 10 and 30 in heavy brush. A table compares effect of hunting on bucks of both habitats. Take from opened brush is about 2.5 times that from heavy brush.

Taber, Richard D., and Raymond F. Dasmann. (U. Calif.) A SEX DIFFERENCE IN MORTALITY IN YOUNG COLUMBIAN BLACK-TAILED DEER. Journal of Wildlife Management 18 (3): 309-315. July 1954.
From summary: "...there is a differential mortality among deer under eighteen months of age, appreciably more males dying than females... It is suggested that the higher metabolic rate of the male, reflected in its greater activity, curiosity, independence, etc. results in an increased male mortality due to starvation, disease and accidents." Literature suggests "that under poor conditions the adult sex ratio tends to be heavier in females, while under good range conditions the sex ratio tends to be about equal. The possibility is suggested, however, that the adult sex ratio may be influenced in the opposite direction by a heavier differential loss among adult females. ...the type of differential sex loss which occurs may be affected by the season at which the population is subjected to the most severe environmental stress."

MAMMALS--MARINE

Bartholomew, George A., Jr. (U. Calif. at Los Angeles.) BODY TEMPERATURE AND RESPIRATORY AND HEART RATES IN THE NORTHERN ELEPHANT SEAL. Journal of Mammalogy 35 (2): 211-218, graph. May 1954.
Gives data on topics mentioned in title and relates findings to habits of the animals.

MAMMALS—MARINE—Continued

Berrill, N. J. HAIR SEALS IN DANGER. Nature Magazine 46 (3): 146-148, 162, illus. March 1953.
The hair or harbor seal is being killed off in eastern Canada under a $10 bounty because it is believed to be an intermediate host of a roundworm of codfish. Worms lower marketability of cod, so seals must go. "...it seems to me to be a pointless vandalism that does nothing but make it possible to say that, justified or not, some action is being taken..."

Cameron, A. W. MAMMALS OF THE TROIS PISTOLES AREA AND THE GASPÉ PENINSULA, QUEBEC. Nat. Mus. Canada Bull. 128. 168-188 p., map. 1953. [From Journal of Mammalogy 35 (2).]
"Phoca vitulina and Halichoerus grypus."

Fisher, H. D. (Atlantic Biol. Sta., St. Andrews, N. B., Can.) DELAYED IMPLANTATION IN THE HARBOUR SEAL, PHOCA VITULINA L. Nature 173 (4410): 879-880. May 8, 1954.
"Evidence...indicates that the phenomenon of delayed implantation is the rule in the family Phocidae and probably in the eared seals as well."

Gilmore, Raymond M., and Gifford Ewing. (Scripps Inst., La Jolla, Calif.) CALVING OF THE CALIFORNIA GRAYS. Pacific Discovery 7 (3): 13-15, 30, illus. May-June 1954.
New calving grounds of gray whale have been discovered on east coast of Gulf of Calif. Map shows migration routes and known calving grounds.

Kenyon, Karl W., Victor B. Scheffer, and Douglas G. Chapman. (US F&WS, 2725 Montlake Blvd., Seattle 2, Wash.) A POPULATION STUDY OF THE ALASKA FUR-SEAL HERD. U. S. Fish & Wildlife Service, Special Scientific Report - Wildlife no. 12. vi + 77 p., illus. June 1954.
Important technical paper based on statistical treatment of large amounts of data on numerous topics. Chief concern is size of herd, which was grossly overestimated for several years. It is now thought that growth of herd has leveled off (at top of logistic growth curve), and that present population is about 1.5 millions, with annual average pup production of about half a million. Some of the subjects considered are counts and measurements, age determination, counts and fecundity of bulls, kill statistics, escapement of bachelors, pup production as indicated by tag recoveries, sample counts and rapid field estimates of living and dead pups, estimates of pup production from trend of harvest and from trend of harem bull count, cows, yearlings, life tables, estimates of herd size from trend of harvest and from harem bull count. Appendixes treat effect of sealing on fluctuations of herd, fecundity of males, size of average harem, age criteria for bachelors, escapement of bachelors, calculations of size of 1947 pup class from tag recoveries, and experiments with aerial photography of herds.

Lawrence, Barbara, and William E. Schevill. (MCZ, Harvard U.) TURSIOPS AS AN EXPERIMENTAL SUBJECT. Journal of Mammalogy 35 (2): 225-232. May 1954.
Study of behavior and learning. An adult was gentle, soon became tame, learned rapidly, and revealed other evidence of intelligence.

Schiller, Everett L. (Arctic Health Research Center, Anchorage, Alaska.) UNUSUAL WALRUS MORTALITY ON ST. LAWRENCE ISLAND, ALASKA. Journal of Mammalogy 35 (2): 203-210, illus. May 1954.
Numerous dead walruses washed ashore are thought to have been killed by one or more explosions off Siberia.

Wilke, Ford. (US F&WS, 2725 Montlake Blvd., Seattle 2, Wash.) SEALS OF NORTHERN HOKKAIDO. Journal of Mammalogy 35 (2): 218-224, illus. May 1954.
Notes on Phoca vitulina, P. fasciata, P. hispida, and Erignathus barbatus: sealing methods, size of catch, utilization, measurements and other species characters, habits, and foods.

MAMMALS—OTHER GROUPS

Buchanan, T. D., and Roy V. Talmage. (Rice Inst.) THE GEOGRAPHIC DISTRIBUTION OF THE ARMADILLO IN THE UNITED STATES. Texas Journal of Science 6 (2): 142-150, maps. June 1954.

Discusses past and present range on basis of questionnaires sent to local wardens in southern states and survey of literature. Several recent expansions and reductions of range are noted. There are now colonies or widespread populations of armadillos in all Gulf states except possibly Miss. The species is expected to colonize all southeastern states. This paper undoubtedly gives the most thorough account of its subject that is available.

BIRDS—GENERAL

Borczynski, Maciej, and Jan Sokolowski. INFLUENCE OF NESTING BOXES ON THE DISTRIBUTION OF SOME FOREST BIRDS. Ochrona Przyrody (Krakow) 21: 160-192, illus. 1953.

Long English summary. Three types of boxes for small birds were put up in forest study plots in Poland. The paper reports on usage by birds, reproductive success of birds using boxes, and relation of birds to wasps, bees, and hornets in boxes. These stinging insects excluded all birds except Muscicapa hypoleuca, which ate the insects and destroyed their nests.

Campbell, Bruce. FINDING NESTS. Collins, St. James Place, London. 256 p. 1953. 12s. 6d. [From review by Wendell Taber, Bird-Banding 25 (2).]

Brings together much good information on how and why to find birds' nests and how to keep records. Many types of nests are discussed.

Lockley, R. M., and Rosemary Russell. BIRD-RINGING / THE ART OF BIRD STUDY BY INDIVIDUAL MARKING. Crosby Lockwood & Son Ltd., 39 Thurloe St., London, SW 7, Eng. viii + 119 p., illus. 1953. 9s. 6d. [From long review by O. L. Austin, Jr., Bird-Banding 25 (2).]

"Here is an excellent pocket-size manual that should be on the reference shelf of every American bander." It gives much information on traps and other techniques, some of which are rarely used in this country. American practices are included.

Sooter, Clarence A. (U. S. Public Health Service, Greeley, Colo.) A TECHNIQUE FOR BLEEDING NESTLING BIRDS BY CARDIAC PUNCTURE FOR VIRAL STUDIES. Journal of Wildlife Management 18 (3): 409-410, illus. July 1954.

BIRDS—MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Beecher, William J. (Chicago Nat. Hist. Mus., Chicago 5, Ill.) ON CORIOLIS FORCE AND BIRD NAVIGATION. Scientific Monthly 79 (1): 27-31, illus. July 1954.

Further information on how Coriolis force could be detected by the semicircular canals and used in navigation. Some previous difficulties are cleared up with the aid of a physicist and certain criticisms of the theory are answered. Beecher grants that other clues (landmarks, sun position) are also used. Navigation by Coriolis force, however, would be more helpful in migration at night.

Collias, Nicholas, and Martin Joos. (U. Wis.) THE SPECTROGRAPHIC ANALYSIS OF SOUND SIGNALS OF THE DOMESTIC FOWL. Behaviour 5 (3): 175-188, 9 figs. 1953.

Spectrographic analysis of sounds from chicks showed that various sounds that attracted chicks were brief, repetitive and had low frequency whereas the sounds that frightened chicks were prolonged, not repetitive and lacked low frequencies. —David E. Davis.

Davis, David E. (Johns Hopkins School of Public Health, Baltimore.) A SIMPLE METHOD FOR OBTAINING ATTENTIVE DATA. Auk 71 (3): 331-332. July 1954.

"An estimate of the proportion of time spent on the nest may be obtained merely by observing the nest at random times and determining the proportion of time the bird is on the nest. By this method it is possible to visit a number of nests serially and record presence or absence of the incubating bird." Visits must be made at different times of day and the bird must not be alarmed. Examples of use of method are given.

BIRDS—MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION—Continued

Davis, John. (Hastings Nat. Hist. Reservation, Carmel Valley, Calif.) SEASONAL CHANGES IN BILL LENGTH OF CERTAIN PASSERINE BIRDS. Condor 56 (3): 142-149. May 1954.
"1. Summer increase in bill length is demonstrable in certain passerine species which eat significant amounts of insects in summer, but are almost entirely vegetarian in winter. 2. The most likely cause of increase in bill length in summer is the reduced amount of wear put on the constantly growing bill tip by a diet rich in insects..."

Dennis, John V. (Box 376, Leesburg, Va.) METEOROLOGICAL ANALYSIS OF OCCURRENCE OF GROUNDED MIGRANTS AT SMITH POINT, TEXAS, APRIL 17-MAY 17, 1951. Wilson Bulletin 66 (2): 102-111. June 1954.

Devlin, Joseph M. (218 S. 43rd St., Phila. 4, Pa.) EFFECTS OF WEATHER ON NOCTURNAL MIGRATION AS SEEN FROM ONE OBSERVATION POINT AT PHILADELPHIA. Wilson Bulletin 66 (2): 93-101, maps. June 1954.

Dixon, Keith L. (Texas A & M Coll.) SOME ECOLOGICAL RELATIONS OF CHICKADEES AND TITMICE IN CENTRAL CALIFORNIA. Condor 56 (3): 113-124, map. May 1954.
Parus rufescens recently has extended its range into an area where Parus inornatus, a larger species, previously was the only member of the genus. Their preferred habitats overlap. The smaller form is at a disadvantage because the larger bird defends its territories throughout the year. Breeding territories of the two were mutually exclusive and interspecific territorial behavior occurred. Ecologic range and spatial holdings of the larger bird did not seem to be restricted. All adjustments had to be made by the smaller species. These include selection of vacated or suboptimal nesting territories and possible modification of territorial behavior.

Elder, William H. (U. Mo.) THE OIL GLAND OF BIRDS. Wilson Bulletin 66 (1): 6-31, illus. March 1954.
Definitive paper that reviews previous work (96 references) and presents research results. Tells how the gland functions and what happens to birds lacking it. In waterfowl the secretion maintains the water-repellent quality of feathers and is essential for maintenance of feather structure. The secretion also helps keep the bill in good condition. It is unlikely that a bird from which the gland had been removed could survive in the wild. The gland is not essential for growth and development but in its absence growth is impaired in mallard and redhead ducks. Secretion of the gland may augment the vitamin D supply of the bird.

Hanson, Harold C. (Ill. Nat. Hist. Survey, Urbana.) CRITERIA OF AGE OF INCUBATED MALLARD, WOOD DUCK, AND BOB-WHITE QUAIL EGGS. Auk 71 (3): 267-272 + 7 plates. July 1954.
Gives day-by-day description of criteria for determining stage of incubation of each of the 3 species. Criteria are those that can be seen in undamaged eggs with aid of portable candler described elsewhere (see WR 76: 59). A series of comparative photographs aids in determining stage of incubation.

Hartley, P. H. T. (Ed. Grey Inst., Oxford, Eng.) WILD FRUITS IN THE DIET OF BRITISH THRUSHES. A STUDY IN THE ECOLOGY OF CLOSELY ALLIED SPECIES. British Birds 47 (4): 97-107. April 1954.
The various species tend to specialize on different kinds of fruits, thus minimizing interspecific competition.

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION--Continued

Nice, Margaret Morse. (5725 Harper Ave., Chicago 37, Ill.) PROBLEMS OF INCUBATION PERIODS IN NORTH AMERICAN BIRDS. Condor 56 (4): 173-197. July-Aug. 1954.

The major paper on its subject and a lesson in scientific procedure. Mrs. Nice critically reviews a great deal of information from Aristotle to the present. She shows that an amazing number of incubation records that are commonly accepted were based on bad guesses and then copied by one author after another. Incubation periods given in most of our bird books cannot be trusted. No attempt is made here to list all correct figures, but many of them are given, especially for groups where error has prevailed. Factors influencing length of incubation are discussed. Bibliography of 5½ pages.

Owen, D. F. (Ed. Grey Inst., Oxford, Eng.) THE WINTER WEIGHTS OF TITMICE. Ibis 96 (2): 299-309, graphs. April 1954.

From summary: "(2) On average the birds weighed least in the early morning and most just before going to roost in the late afternoon. The increase in weight slackened off around mid-day, corresponding with a decrease in feeding. (3) The average weights were inversely correlated with air temperature, owing to increased feeding on cold days. (4) Blue, Great and Coal Tits were on average heaviest in December (or possibly November) and weights then fell gradually. (5) It is suggested that the increase in weight by passerine birds in early winter is an adaptation for a potential shortage of food later."

Raber, Hans. (Zoologischen Garten, Basel.) DAS VERHALTEN GEFANGENER WALDOHREULEN (ASIO OTUS OTUS) UND WALDKAUZE (STRIX ALUCO ALUCO) ZUR BEUTE. Behaviour 2 (1-2): 1-95, 9 figs. 1952.

Experiments were designed to discover what features of sound, sight, smell or taste captive owls recognized in prey. By the use of dummies it was found that mice were recognized by moving limbs and that smell had little influence. Movement also was essential for worms and insects. But a moving bird was not attacked. The essential features were an oval shape with a long tail.--David E. Davis.

Rand, A. L. (Chicago Nat. Hist. Mus., Chicago 5, Ill.) ON THE SPURS ON BIRDS' WINGS. Wilson Bulletin 66 (2): 127-134, illus. June 1954.

Occurrence in groups of birds, structure, origin, use, molt.

Rand, Austin L. (Chicago Nat. Hist. Mus.) SOCIAL FEEDING BEHAVIOR OF BIRDS. Chicago Natural History Museum. Fieldiana: Zoology 36 (1). 71 p. March 1954. $1.00, paper. [From review by Monica de la Salle, Audubon Magazine 56 (3).]

"This very readable paper gives examples of feeding habits that involve co-operation between birds, between birds and other animals, and between birds and man. It is particularly interesting because the author examines, compares and discusses behavior patterns and shows how they may have originated out of general tendencies."

Simmons, K. E. L. (Reading, Eng.), THE NATURE OF THE PREDATOR-REACTIONS OF BREEDING BIRDS. Behaviour 4 (3): 161-171, illus. 1952.

The reactions of breeding birds to potential predators include attack, threat-display, distraction display, direct displacements and fleeing. Observations are cited for plovers and other birds to show that the reactions in the above series (except first and last) are the result of simultaneous activation of attack and fleeing drives at different levels of integration, depending upon stage of breeding and kind of predator.--David E. Davis.

Steinbacher, Georg. INTRODUCTION TO THE STUDY OF BIRD BEHAVIOR. Ornithologische Mitteilungen. In four parts: 4 (6): 132-137; (7): 145-151; (10): 222-230; (11): 250-256. 1952. [From review by R. O. Bender, Bird-Banding 25 (2).]

In German. Bender's complete review: "This series of four papers constitutes another of Steinbacher's excellent reviews of ornithological problems. The subject is treated under the following headings: 1. Preface; 2. The bird

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION--Continued

and its environment; 3. The components of animal behavior; 4. The elements of animal behavior; 5. Learning, memory and intelligence; 6. Moods and emotions; 7. Communication; 8. Territories; 9. The bird and its food; 10. Adults and young; 11. Flocking; 12. Reproductive behavior; 13. The bird and its enemies; 14. Subjective behavior; 15. Hereditary behavior as means of determining specific and generic relationships. The paper concludes with a selected bibliography."

Swinebroad, Jeff. (Ohio St. U.) A COMPARATIVE STUDY OF THE WING MYOLOGY OF CERTAIN PASSERINES. American Midland Naturalist 51 (2): 488-514, illus. April 1954.

Wolfson, Albert. (Northwestern U.) BODY WEIGHT AND FAT DEPOSITION IN CAPTIVE WHITE-THROATED SPARROWS IN RELATION TO THE MECHANICS OF MIGRATION. Wilson Bulletin 66 (2): 112-118, graph. June 1954.

Wolfson, Albert. (Northwestern U.) PRODUCTION OF REPEATED GONADAL, FAT, AND MOLT CYCLES WITHIN ONE YEAR IN THE JUNCO AND WHITE-CROWNED SPARROW BY MANIPULATION OF DAY LENGTH. Journal of Experimental Zoology 125 (2): 353-376, graphs. March 1954.

BIRDS--MANUALS, FAUNAS, COMMUNITIES

Austin, Oliver L., Jr., and Nagahisa Kurado. THE BIRDS OF JAPAN / THEIR STATUS AND DISTRIBUTION. Bulletin of the Museum of Comparative Zoology 109: 277-637, map. 1953. Price not stated. [From review by H. G. Deignan, Bird-Banding 25 (2).]

This monograph has received favorable reviews. It is the only recent and complete account of Japanese birds in English. The authors treat 415 species and their subspecies. "There follows a brief account of the species, dealing with its habitat, range, voice, breeding and general behavior... Scattered through the text are fascinating sidelights on the interrelation of birds and man in Japan... The authors have quite evidently taken pains to produce a book 'as complete and accurate as [they] could make it...'"

Fisher, James, and R. M. Lockley. SEA BIRDS: AN INTRODUCTION TO THE NATURAL HISTORY OF THE SEA-BIRDS OF THE NORTH ATLANTIC. Houghton Mifflin, Boston. 320 p., illus. 1954. $6.00. [From Science News Letter, May 15, 1954.]

"Based on many years of field work and visits along the coast and islands from Spitsbergen and Iceland in the north to Madeira and the Salvages in the warm south. Beautiful photographic illustrations."

Soper, J. Dewey. THE BIRDS OF RIDING MOUNTAIN NATIONAL PARK, MANITOBA, CANADA. Canadian Wildlife Service, Wildlife Management Bulletin, series 2, no. 6. 1-54 p. + 9 figs. Dec. 1953.

Description of area and its life zones and vegetation; annotated list of 194 species. Annotations pertain chiefly to relative abundance and seasonal distribution.

BIRDS--NUMBERS AND NUMBER FLUCTUATIONS

Various authors. REGION REPORTS / WINTER SEASON / DECEMBER 1, 1953--MARCH 31, 1954. Also WINTER BIRD POPULATION STUDY. Audubon Field Notes 8 (3): 235-292, illus. June 1954.

Winter bird reports, an annual feature of Audubon Field Notes, should be of value to many wildlife biologists. They represent the work of scores of observers. Records are screened by experts before publication. There is a separate report for each of 17 regions of the U. S. Abundance, distribution, and unusual records are discussed for each region, often in relation to weather. The second section, population studies, reports results of 38 strictly quantitative studies in many habitats. Some of these population studies take up the consequences of changes in habitats that have been studied year after year.

BIRDS--CONTROL, MORTALITY

Anonymous. WHY NOT "WHIRLERS" FOR THE BIRDS? Pest Control 22 (7): 47. July 1954.

Birds devoured experimental blueberries at W. Va. Agr. Exp. Sta., Morgantown, and were not deterred for long by screen stretched over the bushes, carbide exploders, stuffed hawks and owls, or strips of cloth draped over bushes. "Still shopping around for ideas, somebody...finally noticed those streamers, gaily colored in silver, red, blue, green, commonly used to give gas stations and used car lots a festive carnival air. This advertising novelty, known as a 'whirler,' comes in rolls and, after being unwound, the ribbon-like strip is twisted and fastened up between two supports. Any slight air movement will keep the strip in dizzy motion and, as it seems to wind and unwind, it reflects a constantly flashing light... So the plant breeders suspended some whirlers over the Morgantown blueberry patch and results, as reported in a station publication, were immediately miraculous. The birds deserted their blueberry luncheon table, literally, in droves. What' s more, they didn't come back... Applied later to sweet cherry trees and black raspberry bushes, the whirlers again proved their worth in scaring all fruit-loving avian raiders away for good."

Denis, Keith. (317 Morse St., Port Arthur, Ontario.) MAY STORM TAKES HEAVY TOLL OF BIRDS. News Letter of the Thunder Bay Field Naturalists Club 8 (4): 20. July 1954.

On May 3, 1954, birds that had migrated north across Lake Superior arrived in Ontario only to find everything covered with snow and ice. Birds landed on the cleared highway and were killed by hundreds if not thousands. (The author lists birds actually identified and counted.) Timid species of birds entered cities. Numerous birds were found dead, presumably from starvation and exhaustion. It is estimated that a million birds died in the district during the week.

Kalmbach, E. R. (US F&WS, Denver 2, Colo.) PIGEON, SPARROW, AND STARLING CONTROL. Part II. Pest Control 22 (6): 32, 36, 38, 40, illus. June 1954.

Last installment. One of the points made is that when starlings are driven or excluded from a roost they normally find new roosts and do not come back for a long time. Each starling has its own roosting spot, and if the bird is forced to leave, its spot is not soon filled. Ledges can be made unsuitable for roosting by adding triangular blocks that provide a slanting surface. Spinous metal devices can also be used on ledges. "Still another novel but rather expensive approach is the installation of an uninsulated electric circuit of high voltage but low amperage on all ledges and cornices used by the birds." Trapping and poisoning are seldom practicable measures. Birds can be driven from roosts by Roman candles or fire hoses. Other frightening devices include balloons, hoses made to flap by compressed air, and carbide exploders. Nets can be used to exclude birds from ledges or fruit-bearing plants. All these devices are usually needed for only part of the year. There is little prospect of success in repelling birds with sounds above or below the human range of hearing, for the pest species being considered have narrower range of hearing than we do. There is still no evidence that birds can be repelled practically by radio or radar beams.

Rudd, Robert L., and Richard E. Genelly. (U. Calif., Davis.) LINDANE REPELLENT TO PHEASANTS. California Agriculture 8 (5): 13, graphs. May 1954.

Field reports that birds avoided lindane-treated seeds prompted experiments. In one test, 10 pheasants had choice of plain or treated grain. Treated grain had been mixed with a 75% lindane formulation at the rate of 1 2/3 ounces of chemical per 100 lbs. of grain--a commercially used level. Consumption of treated grain dropped to 1-3% within 9 days and remained there. In another test, 10 pheasants were fed only treated food. They disliked the food, sickened, and lost weight, but regained weight and apparently recovered when put on untreated food. It is concluded that seed treatment not only protects from soil insects, but may also discourage birds from feeding on sprouting seeds. Field tests are still needed.

BIRDS--CONTROL, MORTALITY--Continued

Steiniger, Fritz. MAMMAL CONTROL AND SECONDARY POISONING OF HAWKS AND OWLS. Ornithologische Mitteilungen 4 (2): 36-39. 1952. [From review by R. O. Bender, Bird-Banding 25 (2).]

In German. Bender's complete review: "In a brief discussion of secondary poisoning the author states that only arsenic and thallium sulfate can be suspected; of these arsenic is no longer commonly used. Qualitative analysis for thallium sulfate proved its presence in the liver, spleen, and kidneys of 3 out of 41 dead barn owls. Differentiating between thallium sulfate poisoning and starvation is difficult because extreme emaciation occurs in both."

Zimmerman, Dale A. (480 N. Almont Ave., Imlay City, Mich.) BIRD MORTALITY ON MICHIGAN HIGHWAYS. Jack-Pine Warbler 32 (2): 60-66. June 1954.

BIRDS--PARASITES AND DISEASES

Gustafson, D. P., and H. E. Moses. (Purdue U.) WILD BIRDS AS POSSIBLE SPREADERS OF NEWCASTLE DISEASE. Proceedings Book, Amer. Vet. Med. Assn., 90th An. Meeting, July 20-23, 1953. p. 281-285. [1954?]

A review of literature revealed good evidence for susceptibility of 35 species of wild birds of 8 orders. Some infections were natural, some experimental. At least 15 of the 35 species occur in North America. Some circumstances whereby wild birds may disseminate the disease are cited.

Sachs, Irving B. (U. Ill.) CERTAIN BLOOD-INHABITING PROTOZOA OF BIRDS IN THE VICINITY OF URBANA, ILLINOIS. Transactions American Microscopical Society 72 (3): 216-227. July 1953. [From Auk 71 (3).]

"Records of Leucocytozoon, Trypanosoma, and Haemoproteus in many land birds."

BIRDS--QUAIL

Campbell, Howard. (Dept. Game, N. M.) AVIAN MALARIA IN RELATION TO SURVIVAL AND GROWTH OF A GROUP OF YOUNG GAMBEL'S QUAIL IN CAPTIVITY. Journal of Wildlife Management 18 (3): 416-418. July 1954.

One group of young was held and studied from age of about 3-5 weeks until young adulthood. Most of the group became infected with Plasmodium sp. and Haemoproteus lophortyx. Effects appeared in liver or spleen of some birds autopsied, but the infections apparently had little if any effect on growth and survival.

Goodrum, Phil, and V. H. Reid. (US F&WS, Atlanta 5, Ga.) QUAIL MANAGEMENT ON FORESTED LAND. Journal of Forestry 52 (7): 518-520. July 1954.

For abstract see WR 71: 36 and WR 73: 60. This is published version of paper presented at 6th Annual Meeting, Southeastern Association of Game and Fish Commissioners, Oct. 1952.

Gullion, Gordon W. (Nev. Game Comm.) GAMBEL QUAIL POPULATIONS IN NEVADA. Nevada Fish and Game Bulletin 1 (4): 6-8, 11. April-May 1954.

This desert quail seldom ranges north of the 38th parallel or above 4,500 feet. Although it is limited to southern part of state and has spotty distribution, it ranked third among upland game birds in 1952, with about 16,400 taken. Trapping and banding have shown it to be rather sedentary, with little interchange between areas. Various population estimates are reported. In good habitat in good years, populations reach 2.1 per acre, but 150-200 per square mile is more normal in a good, moist year such as 1952. In normally dry years, populations of 10-15 per mile are usual. Legal kill varied from 4.2% to around 20% in certain areas in 1952 and 1953. It may be heavy locally, but does not seem to be a limiting factor. Annual turnover in Las Vegas Valley was about 95% in 1953, 92% in 1952. Water is important and guzzlers are being installed. They should help maintain a dispersed population and aid carryover during dry years, but they cannot provide the feeding and breeding conditions that adequate rainfall does. Hence they are not likely to maintain large populations in dry years. Populations in valleys have fairly constant habitat and fluctuate only about 250% from year to year. Hill populations are more affected by drought and fluctuate as much as 1000%. No technique for extensive census of this bird has proved practicable in Nev.

BIRDS--QUAIL--Continued

Lewis, John B. (Mo. Cons. Comm., Cameron.) FURTHER STUDIES OF BOB-WHITE MOBILITY IN CENTRAL MISSOURI. Journal of Wildlife Management 18 (3): 414-416. July 1954.

In summer, few individuals traveled more than ½ mile from point of capture. In fall, travels were no greater although covey composition and sometimes covey location changed. In winter, the birds were sedentary, none moving more than ½ mile. In spring, there was greater movement; several birds traveled more than ½ mile and a number of new birds entered area. Nine birds trapped on the area in late winter or spring were shot in fall at distances of 3/4 mile to 12 miles. When maximum travels were tabulated for long periods it was found that 61% of individuals had traveled no more than ½ mile from banding point. "Nevertheless, nearly half the birds for which suitable data were obtained moved more than a half-mile from the banding point, and many others moved nearly that distance. These facts suggest once more the importance of managing quail in larger land units than the individual farm..."

MacGregor, Wallace. (Calif. Dept. Game.) AN EVALUATION OF CALIFORNIA QUAIL MANAGEMENT. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm'rs., June 1-3, 1953. p. 157-160. [1954.]

Evaluation of gallinaceous guzzlers and discussion of how to place them. Calif. now has 1921 guzzlers in operation. The new plastic ones must be fenced for protection from livestock. It is shown that provision of water does build up quail populations if other factors are favorable. Spacing is important. Guzzlers should be 1-2 miles apart for California Quail, 2 miles for Mountain Quail, and perhaps 3-5 miles for Gambel Quail. Sites should be near good covey centers, with good food supplies in the vicinity as well as suitable roosting, nesting, loafing and escape cover. Quail require little water, so there is no point to putting in a guzzler if there is any permanent water within travel range. Other advice is given on placement of guzzlers. Figures are given on travels of quail, and on numbers seen at guzzlers.

McCabe, Robert A. (U. Wis.) HYBRIDIZATION BETWEEN THE BOB-WHITE AND SCALED QUAIL. Auk 71 (3): 293-297, map, + 1 plate. July 1954.

Summary: "Two captive-raised female hybrids between a male Bob-white and female Scaled Quail were compared with a wild-shot male hybrid and the parent species. There was a general overall hybridization of color, but the dimorphic coloration like that of the Bob-white, though subdued, was evident in the hybrids. This cross is likely to occur where the ranges of the two species overlap in Texas and western Oklahoma." The scaled quail is also known to hybridize with Gambel's quail.

Parmalee, P. W., and M. A. Price. (Ill. St. Mus., Springfield.) BRUELLIA ILLUSTRIS (KELLOGG) AND OTHER ECTOPARASITES FROM THE BOBWHITE QUAIL IN TEXAS. Journal of Parasitology 39 (2): 222-223. 1953. [From Auk 71 (3).]

Reeves, Maurice C. (Ind. Dept. Cons.) BOBWHITE QUAIL INVESTIGATION. Indiana Department of Conservation, Final Report PR Project W-2-R. [vii] + 151 p., illus. Mimeo. March 1954.

This voluminous report on an exceptionally thorough state-wide survey should be of interest to everyone concerned with bobwhite management. It is the final report of a 12-year study made to ascertain status, to examine results of stocking, and to provide management recommendations for Ind. Studies include whistling cock counts; sportsman questionnaires; mail carriers' surveys; hunter surveys to determine sex, weight, and age; fall food habits; an intensive study on a special quail area; and a review of artificial propagation. Workers in other areas may be interested in knowing that age ratios from 1947 to 1951 averaged 84.9% juveniles. Sex ratio of adults killed during this period was 62.6% males; juvenile sex ratio was 50.2% males. Ind. has long studied quail distribution in relation to soil types and has made some interesting correlations between populations and kinds of soil. It appears to the reviewer, however, that location within state may be equally important: Indiana's best quail country

BIRDS—QUAIL—Continued

is the southern half of the state, whereas northern and eastern counties are generally poor. The most interesting conclusion from the stocking study was that "if all these released birds had fared as well as the best group studied, they would have equaled about 0.6 percent of the average annual yield with a cost approximately 41 percent of all the revenue derived from license holders who hunt quail."—Fred H. Dale.

Reid, Vincent H. (US F&WS, Alexandria, La.) MULTIPLE LAND USE: TIMBER, CATTLE, AND BOBWHITE QUAIL. Journal of Forestry 52 (8): 575-578. Aug. 1954.
Previously published in Trans. 18th N. Amer. Wildl. Conf. (See WR 76: 63.)

Swank, Wendell G., and Steve Gallizioli. (Ariz. Game Comm.) THE EFFECT OF HUNTING UPON A GAMBEL'S QUAIL POPULATION. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm'rs., June 1-3, 1953. p. 167-171, graph. [1954.]
Author's summary: "A study was made of Gambel's quail populations on two rather similar areas in Pinal County, Arizona. The results of a census obtained by walking a line transect were too variable to obtain definite conclusions on populations. Indications were, however, that at least during a year when there was a good hatch and high survival of young the fall population on an area hunted the previous year was no lower than on an area that had not been hunted. The January populations on both the hunted and non-hunted areas both years was about one bird per two acres. Birds obtained per hour of hunter effort was the same on an area not hunted the previous year and on an area which had been hunted. There was no significant difference in young per adult female for the area hunted the preceding year and for the area that had not been hunted."

Tuttle, H. J. (Va. Comm. Game.) IMPROVING FARM WOODS FOR QUAIL AND OTHER WILDLIFE. Virginia Wildlife 15 (6): 8-9, 25, illus. June 1954.
Usual farm wildlife measures "too often fail to provide the maximum requirements for better hunting." If quail prefer to live in woods, we must practice management in woods. The improvements can aid other woodland game. This paper discusses sizes and numbers of clearings that have been useful, and tells what types of plantings to make in them and how to maintain the plantings. It is advisable to have clearings connected by access trails for movement of equipment and hunters. Pre-existing clearings often can be used. In one area cited, quail were increased from 4 to 16 coveys.

Wallmo, O. C. (Texas Game Comm.) NESTING OF MEARNS QUAIL IN SOUTHEASTERN ARIZONA. Condor 56 (3): 125-128, illus. May 1954.
Notes on 7 nests, several broods, and numerous individuals gave data on habitats, breeding period, and approximate numbers. There was a population increase in 1949-50 and these quail were then relatively common and widely distributed, though by no means abundant.

Wright, J. T. (Ariz. Game Comm.) QUAIL RAINWATER CATCHMENTS AND THEIR EVALUATION. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm'rs., June 1-3, 1953. p. 220-223. [1954.]
Arizona has tried various kinds of water developments for wildlife. Springs can be improved and sometimes windmills and dams are practical. Earthen reservoirs have not worked well. Most widely used is the rainwater catchment, a modified gallinaceous guzzler. The model described here serves all sorts of game. Use of these devices can be evaluated best by actually observing use during morning and evening hours. Examples are given of quail populations building up after catchments were installed. Long term benefits from such developments may be anticipated, but immediate results should not be expected.

BIRDS--PHEASANTS

Hart, Chester M. (Calif. Dept. Game.) RECENT TRENDS IN CALIFORNIA PHEASANT MANAGEMENT. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm'rs., June 1-3, 1953. p. 161-166. [1954.]

Author's summary: "Pheasant hunter numbers reached 205,000 in 1952. This is an increase of 20 percent in three years, and continued gains are expected. Controlled hunting systems have developed and expanded rapidly in California since 1948. Approximately 475,000 acres were under such controls in 1952. Indications are that the near future will see the majority of California's best pheasant habitat under some system of hunting control with a fee charged. The game farm program is being reduced 30-35 percent and emphasis placed on stocking for the gun. Cleaner and more intensive farming is gradually reducing pheasant populations in California's best pheasant ranges."

Low, Jessop B. (Utah St. Agr. Coll.) GAME FARM PHEASANT RETURNS TO THE HUNTERS' BAG / WEBER COUNTY, UTAH, 1946-1951. Journal of Wildlife Management 18 (3): 419-423. July 1954.

A heavily hunted area that had a high population of wild pheasants was heavily stocked with game farm pheasants for 6 years. Age groups of released birds varied, as did length of time before hunting season. Returns of stocked birds varied from 15% to 46% in different years, and averaged 27.6%. Birds released no more than 4 weeks before season gave 40% to 60% returns. Those released more than 4 weeks before season gave less than 30% returns. Released birds made up 18.2% of harvest on average. Hunting statistics are supplied.

Nomsen, Richard C. (Iowa Cons. Comm.) CROWING COCK COUNT. Proceedings Iowa Academy of Science 60: 700-706, maps and graph. 1953.

How Iowa follows trends of its pheasant populations. The spring crowing count provides some of the basic data. Methods of taking it and factors affecting it are described. Since this count covers only males in spring, it is supplemented by a sex ratio derived from conservation officers' winter observations of pheasant concentrations. Number of young per hen is noted by conservation officers during a 2-week period in summer. Results are used with the spring data to get an index of fall population. Examples are given. The method is relatively economical and works well as judged by other studies and by its ability to predict hunting success.

Ryser, Fred A., and Peter R. Morrison. (U. Nev.) COLD RESISTANCE IN THE YOUNG RING-NECKED PHEASANT. Auk 71 (3): 253-266, graphs. July 1954.

Summary: "The development of cold resistance was studied in young Ring-necked Pheasants. Although living in a hot thermal environment the body temperature of the chick is lower than that of the adult, and the regulated level of body temperature gradually rises during the first few weeks of life in a brooder to the adult level. During this period (2 to 15 days), exposure to moderate cold (20°) results in substantial losses in body temperature (2 to 4°). When two- to three-day old chicks are repeatedly chilled by 30-minute exposures at 20°, the development of cold resistance is impaired, and they experience a high rate of mortality. Chicks of seven days and older are not adversely affected by repeated exposures at 20°, which instead improve their resistance to cold." Temperatures are Centigrade.

Schneider, Francis. (Ore. Game Comm.) A PROGRESS REPORT ON AN INTRODUCTION OF PHEASANTS ON NEWLY IRRIGATED OREGON LANDS. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm'rs., June 1-3, 1953. p. 150-156. [1954.]

Introductions encountered several handicaps. The game-farm pheasants were too tame. Some farmers opposed the project because of crop damage, which led to a good bit of poaching. Winter cover was scarce because heavy growth could not be tolerated along canals and ditches. Mowing killed pheasants and broke up nests. But most farmers finally approved the project, cover plantings of several types were made at suitable places, and pheasants increased from 0.65 per 100 acres in 1948 to 12.8 "per 100 habitat acres" in 1953. For similar efforts the author recommends considerably more advance work with the farmers, encouragement of native cover and planting of more, use of wild-trapped pheasants for stocking, and aggressive law enforcement if needed.

BIRDS—PHEASANTS—Continued

Steen, M. O. (Mo. Cons. Comm.) THE PHEASANT IN AMERICA. Missouri Conservationist 15 (5): 1-3, illus. May 1954.

In Eurasia, 32 races of P. colchicus occupy a vast area of many soil and climatic types. Our pheasant is essentially a hybrid of 2 of these races. Many more remain to be tested in this country. It should be possible to find a race that is well adapted to Mo. conditions, or to find one that is nearly adapted and to procede from there by selection and hybridization. In short, the author feels that we have hardly scratched the surface in finding pheasants that are suitable for different regions of the U. S.

Yeager, Lee. (Colo. A & M Coll.) MORE COCK PHEASANTS SHOULD BE SHOT! Hunting and Fishing 31 (4): 11-13, 40-42, illus. April 1954.

Facts and figures gathered by many pheasant experts are clearly explained to show that only 10% to 50%—and rarely as much as 50%—of the cocks are being harvested. It is conservative to say that twice as many cocks could be shot without hurting the population in the least. Indeed, the rest of the pheasants would be better off if more cocks were shot. The problem is how to get this additional kill. The best suggestions seem to be "two or three short pheasant seasons, with as many opening days; bigger bag and possession limits; all day instead of half-day shooting; and greater skill in shooting."

Yeatter, R. E. (Ill. Nat. Hist. Survey.) AIR TEMPERATURE AFFECTS PHEASANT RANGE. Illinois Wildlife 9 (1): 5-6, illus. Dec. 1953.

Observations near Champaign, which is close to the southern edge of pheasant range in Ill., suggested that many eggs laid after late May spoiled because of high air temperatures. Laboratory experiments demonstrated that 14-44% of pheasant eggs might be lost when held at temperatures of 73°-88°F. for part of incubation period. Bobwhite eggs were not injured by the same conditions. [For technical report on this work see Science 112: 529-530, Nov. 3, 1950.]

BIRDS—GROUSE, PARTRIDGE, ETC.

Adams, J. R., and J. F. Bendell. A HIGH INCIDENCE OF BLOOD PARASITES IN A POPULATION OF SOOTY GROUSE. Journal of Parasitology 39 (4, sect. 2): 11. 1953. [From Auk 71 (3).]

"On Vancouver Id., Haemoproteus, Leucocytozoon, Trypanosoma, and Microfilaria were all very common."

Anonymous. BROWN FRANCOLINS MAY GIVE INTERNATIONAL FLAVOR TO HUNTING. Arizona Game & Fish Department Wildlife News 1 (1): 6. June 1954.

"One hundred ninety-five of these eleven to twelve ounce birds arrived...from Pakistan recently. They...will be released on the Robbins Butte and Arlington refuges near Buckeye in Arizona." The state has been informed that this bird does no damage to any crop, is a runner but also a strong flier, and provides more hunting than any other francolin in southeastern Asia. It prefers brushy steppes and hilly country in the vicinity of cultivation and is said not to do well more than 3-4 miles from water. It withstands a wide range of temperatures but cannot tolerate snow. Foods include seeds, insects, green vegetation, and berries. Photographs of native habitat show country amazingly like that of release site.

Babero, B. B. STUDIES ON THE HELMINTH FAUNA OF ALASKA. XVI. A SURVEY OF THE HELMINTH PARASITES OF PTARMIGAN (LAGOPUS SPP.). Journal of Parasitology 39 (5): 538-546. 1953. [From Auk 71 (3).]

"Three species of ptarmigan represented by 292 individuals examined; 109 infested with one or more of 11 species of worms."

BIRDS--GROUSE, PARTRIDGE, ETC.--Continued

Bendell, Jas. F. (Queen's U., Kingston, Ont.) A STUDY OF THE LIFE HISTORY AND POPULATION DYNAMICS OF THE SOOTY GROUSE DENDRAGAPUS OBSCURUS FULIGINOSUS (RIDGWAY). Ph.D. thesis, University of British Columbia. April 1954.

A population was studied on summer range on Vancouver Island. Life history data concern: moult, weights, age criterion for yearlings, sex ratio and weight growth of young, breeding behaviour, delayed migration of yearling males, diurnal and seasonal activity rhythms, fall migration, and present range utilization. The population was stable over four years with density of 0.40 adult males and 0.78 yearling and adult females per acre. A life table was constructed on the basis of a stable population, 80% chick mortality in first 3 months and 31% adult loss per year calculated from banding returns. Survivorship curve is negatively "J" shaped. Mortality rates appear constant and independent of age after first year of life. Space, dispersal, climate, food, predators and disease were considered as factors capable of population control. Four parasites are recorded as new records in this host. Two of the four, Plagiorhynchus formosus and Dispharynx nasuta occur commonly (and only) in the chicks, where they create severe parasitosis. Parasitism by these helminths is an important mortality factor in chicks and a major cause of population stability--an equilibrium between death in older age classes and replacement by surviving young.--J. F. Bendell.

Christensen, Glen C. (Nev. Game Comm.) THE CHUKAR PARTRIDGE IN NEVADA. Nevada Fish and Game Commission, Biological Bulletin no. 1. 1-77 p., illus. April 1954.

A substantial and attractive bulletin that brings together what is known about chukars in Nev. and summarizes release records for other states. Among the many subjects taken up are distribution, physical characteristics, habitat, life history, inimical factors, and management. After good years in 1951 and 1952, reproductive and hunting success fell in 1953. This is ascribed to a cold spring followed by drought. Many birds apparently failed to breed. Deep, lasting snows may cut chukar populations, but range fires and most other conditions seem to have little effect. Water is needed and more watering stations (guzzlers) are being installed. Hunting pressure is too heavy near towns, too light in less accessible areas. To counteract this the author suggests later and perhaps shorter seasons near towns, as well as more guzzlers to help spread out populations, for shooting at waterholes is sometimes much too heavy. Underhunted areas should be advertised, should have earlier, longer seasons, and access roads into them should be constructed when feasible. Introductions into suitable new areas should be made from wild birds trapped at waterholes. No further game farm stock is needed. Seventy-four references.

Greenhalgh, Clifton M. (Utah Dept. Game.) SOME POSSIBLE FACTORS IN CHUKAR INTRODUCTIONS INTO UTAH. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm's., June 1-3, 1953. p. 147-149. [1954.]

Author's summary: "Utah has released over 5,000 chukars in the last two years in fourteen areas. Thirteen of these sites are with game-farm birds, while the fourteenth is with wild birds trapped in Turkey and shipped by air to Utah. The ones selected for the game-farm chukars are canyons with elevations of approximately 6,000 feet with steep rough hillsides. The snowfall is usually light, or the hillsides are so situated so they soon clear after each snow storm. The annual rainfall is between 8 and 12 inches. The canyons have extended streams but unimproved roads. Food is in the form of perennial and annual grasses. Temperature is not considered an important factor, as long as feeding areas are available during the winter months. The fourteen release areas are in widely scattered parts of the state. We do not expect to be successful in all areas, but every effort has been made to eliminate mistakes of past releases."

BIRDS--GROUSE, PARTRIDGE, ETC.--Continued

Gullion, Gordon W. (Nev. Game Comm.) SAGE HEN POPULATION SHOWS STEADY DECLINE IN NORTHEASTERN NEVADA. Nevada Fish and Game 1 (5): 14, 19. June-July 1954.

Population has declined since 1950. Decrease of adults between 1951 and 1952 was about 50%. A good hatch in 1952 permitted a hunting season and 36% increase of adults in 1953. Most broods of 1953 were lost, causing over-all decrease of 39%. Spring surveys of 1954 indicate 40% drop from spring of 1953, and a population about 10% of that of 1949. Hunting in 1951 and 1952 had no population effect, judging from closed areas. Data from other states show that some populations are down, others up or level. Causes of fluctuations are not known. Since 1920, seasons in Nev. generally have been closed in years ending in 6, 7, and 8, suggesting a 10-year cycle coinciding with the northern grouse cycle.

Hohn, E. O. (U. of Alberta, Edmonton.) DISPLAY AND MATING BEHAVIOUR OF THE BLACK GROUSE LYRURUS TETRIX (L). Brit. J. Anim. Behav. 1 (2): 48-58, 3 figs. 1953.

The Black Grouse displays in leks but each male has an individual territory which may be maintained for years. Hens wander about the lek but the males do not follow them out of the territory. Display occurs in morning and evening in spring but only in morning in fall. Females sometimes fight.--David E. Davis.

Moran, P. A. P. (Australian Nat. U., Canberra.) THE STATISTICAL ANALYSIS OF GAME-BIRD RECORDS. II. Journal of Animal Ecology 23 (1): 35-37. May 1954.

In a previous paper (see WR 70: 39) Moran demonstrated that fluctuations of British grouse, ptarmigan, blackgame, and capercaillie were serially correlated. In the present paper data on these fluctuations are compared with temperature and rainfall records for certain seasons, 1871-1930. "Instead of correlating the meteorological series directly with the observed bags, they have been correlated with the residuals from regressions of each year's bag on the previous years... The effect of this should be to increase somewhat the sensitivity of the test of meteorological effects." Population fluctuations correlated best with May temperatures and autumn rainfall. There is thus evidence that the bird populations are influenced by weather and this is particularly evident in the case of capercaillie. "What we wish to know, however, is whether this dependence is large enough to account for the high correlations between the species... On the data used it seems that this is possible but by no means proved."

Williams, G. R. (N. Z. Wildlife Service, Wellington, N. Z.) POPULATION FLUCTUATIONS IN SOME NORTHERN HEMISPHERE GAME BIRDS (TETRAONIDAE). Journal of Animal Ecology 23 (1): 1-34, map and graphs. May 1954.

Based on data from many northern countries, especially on much new data for Canada. Despite much local variation there is a strong tendency for crashes to occur every 9-10 years over large parts of North America. The cycle seems to be about 3 years early in the Maritime Provinces and about 3 years late in Alaska. In Britain length of cycle is about 5 years, while in Fennoscandia it is 3 to 4 years. In Iceland the cycle is long, with some resemblance to that of North America. In Spitsbergen and the U.S.S.R. the cycles are short like those of Britain and Scandinavia. The American cycle is in close synchrony with that of snowshoe hare. In Scandinavia it appears to be connected with the lemming cycle. "When populations of many very different species of animals fluctuate together the most likely synchronizing agent would seem to be a common weather system. There is no evidence in support of the hypothesis that an extraterrestrial factor is responsible." 202 references.

BIRDS--TURKEY

Arner, Dale H. (Md. Game Comm.) THE WILD TURKEY IN MARYLAND, ITS ECOLOGY AND MANAGEMENT. Maryland Conservationist 31 (4): 3-8, illus. July 1954.

Concise account of habitat management, game farm methods, recent kill reports, and weights. Forest clearings are planted to winter wheat, perennial grasses and legumes. Powerline rights-of-way and woods roads are seeded. Many soil treatments and seed mixtures have been tested. Results are judged partly by

BIRDS—TURKEY—Continued

counts of tracks in raked areas around food plots. It is shown that an acre of Ladino clover and orchard grass produces far more turkey food than an acre of forest. Areas where trees are killed for oak-wilt control will be cleared and seeded. One turkey per 100 habitat acres is the goal. Chief difficulties are limited area available for clearing and seeding, and use of turkey plots by deer. Deer make certain types of plantings unavailable to turkeys. Excessive deer populations should be controlled for maximum turkey production. Various methods of preserving wildness in game-farm turkeys are discussed, as are the problems involved. Weights of bagged birds are given for both sexes and for wild and released birds.

Bailey, Wayne. (W. Va. Cons. Comm.) ARE WILD TURKEY REFUGES NECESSARY? West Virginia Conservation 18 (5): 6-9, illus. July 1954.

Data show that refuges and zones around them are no more productive of turkeys than hunted areas of equally good habitat. "...under present conditions refuges are not needed in the better turkey range of West Virginia because of the large size, wildness and inaccessibility of this range. Such an area is actually within itself a region not likely to be overhunted."

Burger, George V. (MVZ, U. Calif., Berkeley.) WILD TURKEYS IN CENTRAL COASTAL CALIFORNIA. Condor 56 (4): 198-206, graphs. July-Aug. 1954.

Study of a population in Santa Clara Co. The population came from a plant of 31 game-farm birds in 1939 and 18 in 1946. By 1951 there were about 250 turkeys over an area of about 14 square miles. Seasonal use of various habitats is described. Fall is critical period because of food and water shortages, which may account for many stocking failures. On study area, these needs were met by irrigation. Activities of turkeys during the year are outlined and graphed and some aspects of reproductive behavior are described. Daily activities are discussed briefly. Sex and age composition of population in 1951 is tabulated and discussed. Broods averaged 10 young at the beginning but dwindled to 3.7 per successful hen by winter. The part wild, part domestic origin of the turkeys was still shown by behavior in 1951. Domestic ancestry was reflected in comparative tameness and tendency to form large flocks. Wild ancestry was reflected in good care and control of young and in lack of evidence that yearling males participate in breeding.

McDowell, Robert D. PRODUCTIVITY OF THE WILD TURKEY IN VIRGINIA. Ph.D. thesis, Virginia Polytechnic Institute. 107 p., map. July 1954.

A study of comparative productivity of Virginia's wild turkey east and west of Blue Ridge Mountains. Hunting regulations, permitting longer seasons and larger bags in eastern region, are set using Blue Ridge as line of demarcation. Data from field personnel were used to analyze productivity through such measures as clutch size, fertility, hatch, and brood sizes during spring, summer, and fall months of 1953. The writer describes, in detail, techniques whereby adequate "correct" samples of the various measures of productivity were obtained. No significant differences between the two populations were found in any of these measures. Analyses of kill report cards indicated an adult hen:juvenile ratio of 1:3.7 west of the Blue Ridge and a ratio of 1:1.8 east of the Blue Ridge. This very significant difference was interpreted to indicate relative nesting success in the two regions. The factor deciding the inauguration of this study was the 25.2% decline in reported kills of 1952-53 and the 1951-52 seasons. Statistical analyses indicated that this decline was not caused by decrease in productivity. In the writer's opinion, the decrease arose from reduction in hunting pressure resulting from inclement weather and from reduction in availability of turkeys to gunners because of an unusually bountiful food supply.—R. D. McDowell.

Richards, Clarence E. AN EVALUATION OF THE WILD TURKEY RESTORATION PROGRAM IN WESTERN VIRGINIA. M.S. thesis, Virginia Polytechnic Institute. 74 p. June 1954.

An investigation of success of restocking with game-farm-raised wild turkeys using various release methods. Some comparative data from other states are given on success of restocking with wild-trapped and game-farm turkeys.—V. Schultz.

BIRDS—DOVES AND PIGEONS

Bartholomew, George A., Jr., and William R. Dawson. (U. Calif., Los Angeles.) BODY TEMPERATURE AND WATER REQUIREMENTS IN THE MOURNING DOVE, ZENAIDURA MACROURA MARGINELLA. Ecology 35 (2): 181-187, illus. April 1954.

Experimental study of temperature regulation and water consumption under varied conditions. Ecological conclusions are summed up as follows: "A number of factors contribute to the success of the mourning dove in meeting the extremes of heat and aridity in the desert. Its capacity to endure elevated body temperature without damage simplifies its over-all problem of heat regulation. Unlike some desert birds, it is not confined to the immediate vicinity of water. Its capacity to withstand dehydration, its capacity for sustained and speedy flight, and its capacity to make up large water deficits in a few minutes combine to allow it to range widely over the desert with only periodic visits to water."

Einarsen, Arthur S. (210 Agr. Eng. Bldg., Corvallis, Ore.) PROBLEMS OF THE BAND-TAILED PIGEON. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm'rs., June 1-3, 1953. p. 140-146. [1954.]

Gives a good review of life history and habits, then discusses reproductive potential and management needs. A pair produces 1 or at the most 2 young per season. Hunting is concentrated at roosting, loafing or drinking areas and often wipes out all or most of a flock. Few people understand the bird's needs. Large bag limits are favored and hunting pressure grows each year. Young of the year make up only about 20% of the bag. Some birds are still feeding young when season opens. Many of the pigeons shot are lost. Favorite concentration areas are being commercialized for shooting. We strongly need an adequate inventory of the population and a determination of the kill. Suggestions are offered for getting these data. Annual kill seems to be about 500,000 and we do not know that the population can support it. Acquisition of the small concentration areas would be a great management aid, for it would permit considerable control of harvest. These areas should be acquired now while it is still possible. "...a few thousand dollars spent now may be of great value in perpetuating the band-tails."

Hammond, James W. (Tenn. Game Comm.) WHAT WE KNOW ABOUT DOVES. Tennessee Conservationist 20 (6): 6-7, illus. June 1954.

Brief review of natural history and research findings in state. Trichomoniasis appeared in only about 1% of Tenn. doves in 1950-51, a bad year for the disease in some states. The population of 1951 was much lower than those of 1949 and 1950, however, because of winter storm, disease, and poor nesting season. Numbers rose considerably in 1952 and slightly in 1953. Doves return to Tenn. largely in Feb. and March. Numbers are relatively stable April-June. Peak of hatch is from middle of May to end of June. Most doves that are banded in Tenn. and are later shot are shot there, but others are taken from Texas to Fla. Cripple loss is about 31%. Hunting takes less than 20% of population (combined data from cooperating states).

Quay, Thomas L., editor. (N. C. St. Coll.) MOURNING DOVE POPULATIONS IN NORTH CAROLINA. North Carolina Wildlife Resources Commission. 1-47 p., illus. June 1954.

An attractive, comprehensive publication that summarizes the state's dove studies. Text is simply written yet informative, and much quantitative information is given in maps, graphs, and tables. Chapters are devoted to life history and habits, seasonal residence and movements, populations around the year, annual production, hunting and hunter success, population turnover, and management. Facts and conclusions are too numerous to be summarized here. It is safe to say that this booklet is one that all persons interested in doves will wish to have available.

Schein, Martin W. (USDA, Jeanerette, La.) SURVIVAL RECORDS OF YOUNG FERAL PIGEONS. Auk 71 (3): 318-320. July 1954.

"The object of this note is to present some recent data on the survival of the feral domestic pigeon...from egg to fledgling, utilizing the terms recommended by Davis (Auk, 69: 316-320, 1952)." Work was done in Baltimore and involved 234 nests and 445 eggs, 234 of which hatched. Number of nestlings that fledged was 130. Probability that eggs would hatch = 0.526. Probability that eggs would survive to fledge = 0.292. Probability that nestlings would fledge = 0.556.

BIRDS--DOVES AND PIGEONS--Continued

Winston, Frank A. (Fla. Game Comm.) STATUS, MOVEMENT AND MANAGEMENT OF THE MOURNING DOVE IN FLORIDA. Florida Game and Fresh Water Fish Commission, Technical Bulletin no. 2. 1-86 p., illus. 1954.

Research report; contains 19 maps, 20 tables, and 4 graphs. Gives results of random road counts, controlled road counts, mail carrier census, call counts, trapping, banding, and color dyeing. Much information is included on techniques and procedures. It is shown that Fla. has much good dove habitat and that land-use trends favor doves. Response to shooting, natural mortality, origins of doves shot in Fla., and movements within state are discussed at length. The source of large concentrations in S. Fla. is considered far from certain. Hunting under present regulations is believed to have no effect whatsoever on dove populations. Natural mortality is so great and occurs so early in fall that effect of hunting is only a drop in the bucket. Reasons for this conclusion are presented. Since harvests can be and should be increased, recommendations are made for several sorts of seasons that should be considered: 30-day split season, 30-day season by zones, and 60-day continuous season. The 60-day season is preferred. Relaxation of regulations should be gradual, with populations watched for effects.

BIRDS--WATERFOWL

Anonymous. WILD MALLARDS FOR HUNTING OR MARKET. Magazine of Ducks and Geese 5 (3): 6-8, 21, illus. Summer 1954.

Gives apparently practical instructions for rearing mallards for marketing or for providing paid shooting on the premises. Part of the instructions cover establishment of flight lanes favorable to shooting.

Atkeson, Thomas Z., and Lawrence S. Givens. (US F&WS, Atlanta, Ga.) THE USE OF LIVESTOCK PASTURES IN SOUTHEASTERN WATERFOWL MANAGEMENT. Journal of Wildlife Management 18 (3): 407-408. July 1954.

Values of pastures to geese, suitable plant species, pasture management. Pastures may be used by cattle and geese at the same time.

Buechele, Charles L., and Douglas Nosler. (181 Indiana St., Maplewood, N. J.) CLOSE NESTING OF MALLARD AND MARSH HAWK. Murrelet 35 (1): 10. Jan.-April 1954.

Nests were 39 inches apart in marshy spot in wheat growing area of Washington where natural cover was scarce. Young were produced successfully from both.

Burnett, Frances L., and Dorothy E. Snyder. (MCZ, Harvard U.) BLUE CRAB AS STARVATION FOOD OF OILED AMERICAN EIDERS. Auk 71 (3): 315-316. July 1954.

Two oil tankers broke up off Mass. in Feb. 1952. Hundreds of waterfowl, especially American eiders, were found killed by oil. Total mortality of eiders may have run to many thousands. Two eiders found dead had attempted to eat blue crabs (Callinectes sapidus), but crabs lodged in esophagus and may have caused death.

Collins, Burton D. (Calif. Dept. Game.) A NESTING STUDY OF THE CANADA GOOSE AT TULE LAKE AND LOWER KLAMATH NATIONAL WILDLIFE REFUGES. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm'rs., June 1-3, 1953. p. 172-176. [1954.]

Topics include characteristics of nest sites, cover types of sites, nesting success, causes of failures, grouping of broods, and total production. Of 201 nests observed, 158 hatched, giving nesting success of 78.6%. Desertion, the major cause of nest failures, was attributed to crowding on islands and consequent intraspecific strife. Hatching success for successful nests was 87%, with average clutch of 5.13 eggs and average hatch of 4.43 eggs. Two per cent of the eggs were infertile and about 9.5% contained dead embryos. Brood counts indicated that some broods joined with others in first week after hatching. Total goose production at Tule Lake in 1952 was 1,845 young.

BIRDS--WATERFOWL--Continued

Crissey, W. F., compiler. (US F&WS.) 1954 STATUS REPORT OF WATERFOWL. U. S. Fish & Wildlife Service, Special Scientific Report--Wildlife no. 26. 1-97 p., maps. Aug. 1954.
"These data are brought together here for the purpose of supplying administrators with a factual basis for setting the shooting regulations for the 1954-55 season, and for other management purposes." Data are based on 3 surveys: kill during last hunting season, wintering grounds, and breeding grounds. Results are discussed for each flyway. Results of the population and production study made on breeding grounds in 1954 are given in considerable detail for each region within a flyway. Increases or decreases are predicted for each region of the breeding grounds and for each flyway as a whole. Many of the statements and figures pertain to individual species.

Diamond, Louis S., and Carlton M. Herman. (U. S. Bur. Animal Industry, Beltsville, Md.) INCIDENCE OF TRYPANOSOMES IN THE CANADA GOOSE AS REVEALED BY BONE MARROW CULTURE. Journal of Parasitology 40 (2): 195-202, illus. April 1954.
Describes simple method of getting bone marrow sample from living birds, and describes successful new medium. By these techniques trypanosomes were found in 14.1% to 40.2% of geese from various areas, indicating that the infection is widespread.

Dresser, Cleveland van. WHAT'S HAPPENING TO OUR DUCKS? PART 7. TRIPLE THREAT IN NORTH DAKOTA. Sports Afield 131 (6): 83-87, illus. June 1954.
Four waterfowl refuges, Upper and Lower Souris, Des Lacs, and Lostwood, are important, strategic breeding and resting areas. They have been developed effectively for waterfowl. They are located in a great wheat-growing region. One threat to them comes from farmers, who still suffer some crop damage despite artificial feeding on refuges and herding by airplane. A bill actually was introduced for elimination of Lower Souris. The second threat is pressure for oil exploration, which could lead to widespread pollution. This threat could be met by state laws to control pollution on refuges. The third threat is the Bureau of Reclamation's Garrison Dam Diversion Plan. It would ruin Lower Souris by turning it into a lake, and it would reduce rather than increase the amount of farmland in the area. Crop damage by ducks would be increased, for there would be little other food for them. This project, which the author considers economically unjustified, would cost the public over half a billion dollars.

Dresser, Cleveland van. WHAT'S HAPPENING TO OUR DUCKS? PART 8. CAN THEY GET TOGETHER ON GRAYS LAKE? Sports Afield 132 (1): 80, 82-84, illus. July 1954.
Thirty years ago Grays Lake in eastern Idaho was a 22,000-acre area of marsh and water, one of the most productive areas of the West, a great nesting and resting place for waterfowl. Then it was drained to provide irrigation water for an Indian reservation. Stockmen grazed their stock on the nearly dry bed, although they had no legal claim to the land. Water for the Indian lands will soon be available from another source, and the Fish & Wildlife Service wishes to restore Grays Lake. But the Service would have to pay an annual bill for water to the Indian lands, and would have heavy expenses in restoring Grays Lake. Furthermore, stockmen powerfully oppose the project in the belief their grazing would be lost or would come under government control. The author maintains that their grazing would be improved and would not be under control, and that stockmen as well as hunters stand to gain by the change. The catch is to convince the ranchers and to get money for the work.

BIRDS--WATERFOWL--Continued

Elder, William H. (U. Mo.) THE EFFECT OF LEAD POISONING ON THE FERTILITY AND FECUNDITY OF DOMESTIC MALLARD DUCKS. Journal of Wildlife Management 18 (3): 315-323. July 1954.

Describes several experiments and numerous difficulties that arose in the course of them. In 1948 birds on a diet of commercial duck pellets and greens were dosed with 6 no. 6 chilled shot and later with 18 more. Body weights and red cell counts were studied. Symptoms were mild because of the soft, rich diet. "There was no statistically significant difference in fertility or embryonic deaths among the four breeding groups, but the percent of infertile eggs in Group 1, where both sexes had been leaded, was greater following 18 shot than it was following ingestion of 6 shot." Significant or not, however, in both trials the percentage of infertile eggs was highest where both parents had been leaded. In 1949, mallards on grain diet were fed 18 shot. Effects were drastic; many birds died. "However, normal birds did not exceed leaded birds in fertility, embryonic success, or hatchability. But in both years the normal hens surpassed leaded hens in fecundity for the season." Whether or not the difference in fecundity was enough to matter in nature is open to opinion. It is possible that wild mallards, especially while young, might be more severely affected than experimental domestic mallards.

Herman, C. M., and E. E. Wehr. (Patuxent Refuge, Laurel, Md.) OCCURRENCE OF AMIDOSTOMUM IN CANADA GEESE. Journal of Parasitology 39 (4, sect. 2): 34. 1953. [From Auk 71 (3).]

"This pathogenic gizzard nematode is widely distributed in the U. S. and is apparently responsible for winter mortality on a North Carolina refuge."

Kuhlemann, Peter. DUCK CATASTROPHE AT HOHWACHT. Ornithologische Mitteilungen 5 (6): 111-112. 1953. [From review by R. O. Bender, Bird-Banding 25 (2).]

In German. "This is an account of the loss of about 10,000 ducks, mergansers, and divers resulting from 'oiling' during the second week in January. Variable winds brought the oiled birds ashore all through the early spring. The author pleads for international recognition of and action on oil pollution near coastlines."

Mackay, R. H. (Canadian Wildl. Service, Vancouver, B. C.) TRAPPING OF TRUMPETER SWANS IN BRITISH COLUMBIA. Canadian Field-Naturalist 68 (1): 28-30. Jan.-March 1954.

Describes capture of 5 swans and their shipment by air to Severn Wildfowl Trust in England. The swans were baited into a large trap made of posts and netting and equipped with a large door that could be dropped by a trip wire.

Martini, Erlend. "OIL-PLAGUE"--OBSERVATIONS FROM SPIEKEROOG ISLAND. Ornithologische Mitteilungen 5 (3): 44-48. 1953. [From review by R. O. Bender, Bird-Banding 25 (2).]

In German. "A table of 108 birds of 15 species found oiled on this North Sea island during 6 months of 1951 and 3 of 1952. The Common Scoter (Melanitta nigra) was the principal victim, numbering 67 of the 108 casualties."

Mason, Edwin A. (Arcadia Wildl. Sanct., Easthampton, Mass.) WOOD DUCK POPULATIONS AT ARCADIA. Bulletin of the Massachusetts Audubon Society 38 (6): 266-267, graph. June 1954.

Graph of numbers observed at the sanctuary, 1944-52, indicates a sharp drop in 1944-46, with the new lower level remaining fairly constant since then.

McCall, J. D. (Ind. Dept. Cons.) PORTABLE LIVE TRAP FOR DUCKS, WITH IMPROVED GATHERING BOX. Journal of Wildlife Management 18 (3): 405-407, illus. July 1954.

Description, illustrations, and bill of materials for an ingenious, collapsible funnel trap that can be carried on car top. A special feature is the gathering box, which is part of the trap, and which can be lifted from water and closed by pulling ropes.

BIRDS--WATERFOWL--Continued

McKinney, D. F. (Severn Wildfowl Trust, Slimbridge, Gloucestershire, Eng.) AN OBSERVATION ON REDHEAD PARASITISM. Wilson Bulletin 66 (2): 146-148, illus. June 1954.

A hen redhead duck at Delta, Man., forced its way onto a canvasback nest and laid an egg despite punishment by owner. Is this normal mode of parasitism by redheads?

Miller, A. W. (Calif. Dept. Game.) DUCK AND COOT PRODUCTION AT TULE LAKE AND LOWER KLAMATH WILDLIFE REFUGES IN 1952 BASED ON A NESTING STUDY. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm's., June 1-3, 1953. p. 182-188. [1954.]

Material of the present paper is similar to that published elsewhere (see WR 76: 74) except that the present paper includes tabular data of tentative type on mortality of immatures and adults and on several aspects of population dynamics. The author believes that local production of all duck species, except perhaps ruddy, is enough to offset mortality.

Misonne, X. THE GREAT WINTERING GROUND OF THE SOUTHEAST CASPIAN SEA. Le Gerfaut 43 (2-3): 103-127. 1953. [From review by O. L. Austin, Jr., Bird-Banding 25 (2).]

In French. "The marshes and plains of the Iranian coast of the Caspian Sea are perhaps the greatest wintering ground still extant for northern waterfowl." Hunting is unrestricted and is done from boats and jeeps. Annual kill is between 50,000 and 100,000, which is about 2 or 3 per cent, an insignificant proportion. At present the natives are poorly armed and are somewhat loathe to eat meat that is not killed ritually. But rapid changes are coming. "Long before adequate measures to preserve them can be taken, the clouds of waterfowl in the Bandar-i-Gaz and the geese and bustards on the adjoining plains will be nothing but a memory."

Oglesby, C. V., and Fred A. Glover. (Nev. Game Comm.) BODY TEMPERATURES OF BOTULISTIC PINTAILS. Condor 56 (3): 162-163. May 1954.

Patterson, Robert L., and Robert M. Ballou. (Wyo. Game Comm.) STATUS OF THE CANADA GOOSE IN WYOMING. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm's., June 1-3, 1953. p. 194-200. [1954.]

Formally published version in Wyoming Wildlife for Aug. 1953. For abstract see WR 75: 61.

Rosen, Merton N., and John B. Cowan. (Calif. Dept. Game.) WINTER BOTULISM: A SEQUEL TO A SEVERE SUMMER OUTBREAK. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm's., June 1-3, 1953. p. 189-193. [1954.]

A severe outbreak of botulism occurred at Gray Lodge Refuge, Calif., in fall of 1952. Thousands of dead ducks were picked up but many were not found. "The disease appeared to have run its normal course and declined by the first week of November, but recurred subsequent to the first rainstorm. A resurgence followed each succeeding storm. An increased mortality rate appeared as a sequela to drainage during the dry period from late January to the middle of March. Analysis of these factors indicates the following conclusions: (1) The fall epizootic produced heavy concentrations of toxin in the pond bottoms; (2) unrecovered carcasses decaying in tule thickets increased this concentration; (3) each subsequent storm washed additional toxin into solution in the ponds; (4) then still further concentration was effected by withdrawal of water from this solution by evaporation, slow drainage, and (5) exposure of contaminated mud flat edges followed... No evidence of relation was found between temperature and the course of the epizootic. Finally, it has been demonstrated that the source of the disease in this winter outbreak of botulism was preformed toxin."

Schiller, E. L. (Box 960, Anchorage, Alaska.) STUDIES ON THE HELMINTH FAUNA OF ALASKA. XIV. SOME CESTODE PARASITES OF THE ALEUTIAN TEAL (ANAS CRECCA L.) WITH THE DESCRIPTION OF DIORCHIS LONGIOVUM N. SP. Proceedings Helminthological Society of Washington 20 (1): 7-12. 1953. [From Auk 71 (3).]

BIRDS--WATERFOWL--Continued

Scott, Peter, and James Fisher. A THOUSAND GEESE. Wm. Collins, Sons & Co., London. 240 p. + 17 pls. 1953. 21s. [From review by N. Tinbergen, Nature, May 15, 1954.]

The pinkfoot goose was known to winter mainly in Britain and to breed in the Arctic, but its main breeding grounds were unknown. Scott found strong reasons for believing that the largest colonies would be in the interior of Iceland. In the summer of 1951, Scott, Fisher, and Gudmundsson discovered these colonies and managed to band 1,151 pinkfoots. "A Thousand Geese" is the narrative of the expedition. "Apart from the story, the book contains, in an appendix, detailed information on the status of the pinkfoot in Spitsbergen, on its status in Greenland, notes on the birds observed at the camp site, a list of plants found (compiled by Gudmundsson), estimates of the local pinkfoot population, and a bibliography of the breeding distribution of the species. The illustrations are excellent..." "In a footnote at the end of the book Scott adds that he went again in 1953 and that this time, using the experience gained in 1951, he caught 9,005 geese. According to his estimates about 'one in five of the world pinkfoot population now carries a ring.' The repeated sampling makes calculations of the Icelandic population possible, and the large-scale ringing will provide valuable data on various aspects of pinkfoot population ecology."

Wingfield, Billy, and Jessop B. Low. (Utah St. Agr. Coll.) WATERFOWL PRODUCTIVITY IN KNUDSON MARSH, SALT LAKE VALLEY, UTAH. Proc. 33rd An. Conf. Western Assn. St. Game & Fish Comm'rs., June 1-3, 1953. p. 177-181. [1954.]

Gives figures for waterfowl productivity (to hatching) of the 6 cover types for mallard, cinnamon teal, redhead, and ruddy duck. Study was made in 1950 and was based on 738 nests. There were 5.3 nests per acre of vegetation. Hardstem bulrush was used for 64.9% and Olney's bulrush for 29.7% of nests. These percentages are roughly proportional to the extent of these types. A high of 17.9 mallards hatched per acre of hardstem bulrush. Olney's bulrush produced 14.4 mallards per acre. Hardstem bulrush was the most important cover for hatching of mallards and redheads, while Olney's bulrush was most important for teal, and cat-tail was most important for ruddy ducks. On the 174-acre marsh there was a total known hatch of 14.9 per acre: mallard, 9.8; teal, 1.8; redhead, 2.7; and ruddy duck, 0.6.

Wrakestraw, George F. (Wyo. Game Comm.) PINTAIL MIGRATION PATTERNS. Wyoming Wild Life 18 (7): 16-18, maps. July 1954.

Since 1952, 1,759 pintails have been banded in Wyo. and 4% have been recovered. Recoveries are mapped and discussed. Most adults were recovered in Calif. or Utah, or, at later dates, in the Gulf States. Most immatures apparently traveled directly to the Southeast. This fits what is known of the peculiar migratory habits of this duck. Most pintails pass through northern plains and mountain states before season opens. There are 2 important flight periods in Wyo., one in western part in Sept., another in eastern part in early Oct. An earlier season would help Wyo. and near-by states get a fairer share of pintails and might lighten crop damage problems in Calif. On the other hand, most hunters prefer a season that coincides with the late mallard flights from Canada.

Yancey, Richard K. (La. Wild Life Comm.) THE FUTURE OF LOUISIANA'S CANADA GOOSE. Louisiana Conservationist 6 (9): 10-11, illus. July-Aug. 1954.

Louisiana's Canada goose populations are dwindling rapidly. Jan. inventory counts fell from 32,000 in 1950 to 5,200 in 1954. A huge amount of good habitat, much of it in refuges, is almost empty. The trouble lies in "harvest refuges" of northern states of Miss. flyway. Horseshoe Lake in Ill. is the prime example but similar areas exist or are being created in other states. "Harvest refuges" are places where geese are fed and induced to winter north of their usual wintering grounds. Horseshoe Lake stops over 60% of the total flyway population. Artificial feeding holds the geese. "...nothing can be done under the present laws because it's completely legal. As a result of this abnormal situation, 54,000 Canadas were slaughtered over the firing lines which surround this so-called refuge during the 1953 season, and this does not include the 30% crippling loss." Furthermore, the once-wary Canadas are practically domesticated and easily slaughtered at such places. "The future for Louisiana's Canada Goose flock and the Flyway population as a whole is black, to say the least."

BIRDS--CRANES, RAILS, SHOREBIRDS

Laubenfels, Max W. de. (Ore. St. Coll.) A SECOND FLOCK OF WHOOPING CRANES. Wilson Bulletin 66 (2): 149. June 1954.
On March 20, 1952, half a dozen birds believed to be whooping cranes were seen with a flock of sandhill cranes in Okla. Whoopers of Texas flock were still at Aransas Refuge. Mr. Julian Howard, manager of Aransas Refuge wrote "that he had a number of other records of a possible additional small flock of Whooping Cranes, presumably wintering in Mexico, but that all the other records were more questionable than mine." [If another flock of whooping cranes does exist, surely its wintering ground should be located and protected.]

McLeod, Edith Rutenic. (Klamath Falls, Ore.) SANDHILL CRANES AT MEISS LAKE, NORTHERN CALIFORNIA. Condor 56 (4): 227. July-Aug. 1954.
About 1500 cranes stop at this lake during spring and fall migration. There is evidence that the same birds use Malheur Refuge. Cranes do enough damage to young hay and grain plantings that some farmers are intolerant of them. "Crop damage by ducks, geese and cranes appears to be a mounting complaint among the ranchers, and it is becoming an increasing problem as more land is placed under cultivation."

Naylor, A. E., A. W. Miller, and M. E. Foster. (Calif. Dept. Game.) OBSERVATIONS ON THE SANDHILL CRANE IN NORTHEASTERN CALIFORNIA. Condor 56 (4): 224-227, map. July-Aug. 1954.
Locations, habitats, habitat changes, status, reproduction; for years 1948-53.

OTHER BIRDS

Ferens, Bronislaw. THE EAGLE-OWL (BUBO BUBO [L.]) IN POLAND, ITS BIOLOGY AND HABITS. Ochrona Przyrody (Krakow) 21: 78-114, illus. 1953.
Has English summary. A long paper that reviews habits, biology and status of these owls and makes recommendations for their conservation. The species is in danger of extermination in much of Europe. Only 60-70 pairs remain in Poland. Conservation problems are discussed and efforts to restore the species in Germany are examined.

Garlinghouse, J. W. (Soil Cons. Serv., Fallbrook, Calif.) RAISE YOUR OWN GOPHER TRAPS. Soil Conservation 19 (11): 255-257, illus. June 1954.
A. H. Anthony, avocado grower of Fallbrook, felt that he was running a gopher farm. "Now he is raising his own gopher traps in the form of barn owls by providing them with especially designed shelters in which they rear their young... The location and design of owl houses are important. Each pair of owls requires about 10 acres of hunting ground, and an aggressive pair will drive all others out of its territory. Placing the houses a minimum of 500 feet apart in all directions proved satisfactory... Best results are obtained if a hollow log, at least 4 feet long and 18 inches in inside diameter, is placed horizontally on a pole 10 or more feet from the ground... The hollow log is firmly fastened to the top of the pole and one end is boarded up... The owls will nest as far back in the log as they can, the open end will not attract bees, since bees seem to prefer a small opening leading into a larger chamber." Isolated corners with little human disturbance were best sites. Now Anthony has 10 occupied owl houses in his 65-acre grove. Pellets of his owls contain remains of various small mammals (itemized for one nest), but gophers lead the list. Domestic chickens and ducks and their young run loose on the place but are not bothered by the owls.

Giles, LeRoy W., and David B. Marshall. (US F&WS, Fallon, Nev.) A LARGE HERON AND EGRET COLONY ON THE STILLWATER WILDLIFE MANAGEMENT AREA, NEVADA. Auk 71 (3): 322-325. July 1954.
Describes habitat and gives figures (by species) on nest census. The principal colony contained an estimated 1,191 nests. Nests were chiefly in and built of hardstem bulrush. Carp apparently were an important food. The birds considered were great blue heron, black-crowned night heron, snowy and American egrets, and white-faced glossy ibis.

OTHER BIRDS--Continued

Hofslund, Pershing Benard. A LIFE HISTORY STUDY OF THE YELLOW-THROAT, GEOTHLYPIS TRICHAS. Ph.D. thesis, U. Michigan. 186 p. 1954. [From long abstract in Dissertation Abstracts 14 (4).]
Comparative studies were made at Ann Arbor and Duluth.

Howell, Joseph C. (U. Tenn.) A HISTORY OF SOME BALD EAGLE NEST SITES IN EAST-CENTRAL FLORIDA. Auk 71 (3): 306-309. July 1954.
Occupancy of 24 nest sites was studied in 1935, 1940, 1946, and 1951. "...I would interpret the data as probably indicating that this group of nest sites was occupied in 1951 by from 70 to 90 per cent of the pairs occupying these sites in 1935." Aerial observation was most helpful in locating nests and determining occupancy.

Mackowicz, Roch, and Jan Sokolowski. CORMORANT RESERVATION ON THE BRDA RIVER IN THE CZLUCHOW DISTRICT. Ochrona Przyrody (Krakow) 21: 115-159, illus. 1953.
Long English summary. Phalacrocorax carbo was almost exterminated in Poland but there are now 7 colonies in special reservations. The authors studied the largest colony. Their paper covers many topics in life history, ecology, and behavior. [This and other articles in the same volume are of interest in showing that even behind the Iron Curtain sincere efforts are being made to save such unpopular animals as bats, eagle-owls, and cormorants, with reservations having been set up for them.]

Meanley, Brooke. (US F&WS, Box 270, Stuttgart, Ark.) NESTING OF THE WATER-TURKEY IN EASTERN ARKANSAS. Wilson Bulletin 66 (2): 81-88, illus. June 1954.
Courtship, incubation, nesting success, etc.

Read, Bayard W. (Upper Dogwood Lane, Rye, N. Y.) FLORIDA'S SNAILHAWK. Atlantic Naturalist 9 (5): 224-232, illus. May-Aug. 1954.
The Everglade kite is down to less than 50 pairs and its nesting area is not over 2 square miles. The species has been hit hard by drainage, shooting, and frequent disturbance of nesting sites. These, coupled with the bird's lack of adaptiveness and restricted diet (a single species of snail), are driving the kite to extinction. An intensive educational program in the kite's range should help, and the breeding area should be protected. The Army Engineers may hold the bird's fate in their hands, for one overly great drop of water level might cause extermination.

Sharritt, Grace V. WHAT OF THE MAGPIE? Nature Magazine 47 (7): 370-372, 388, illus. Aug.-Sept. 1954.
Magpies are on the bounty list in several western states. This article tells what states have these bounties and gives some information on how many magpies are bountied. It also reviews the good and bad sides of magpie food habits. Magpies eat great numbers of insects and will eat many mice when mice are abundant. But they also are predators of eggs of ducks and other birds, they peck out the eyes of young cattle and big game, and they pick open sores with serious results. Sportsmen and ranchers naturally hate them. The author hopes that magpies and other predatory birds can be protected except where they become unmistakable pests.

REPTILES AND AMPHIBIANS

Allen, E. Ross, and Wilfred T. Neill. (Silver Springs, Fla.) THE FLORIDA CROCODILE. Nature Magazine 45 (2): 77-80, illus. Feb. 1952.
Useful summary of history and natural history.

Brattstrom, Bayard H. (U. Calif., Los Angeles.) THE FOSSIL PIT-VIPERS (REPTILIA: CROTALIDAE) OF NORTH AMERICA. Transactions of the San Diego Society of Natural History 12 (3): 31-46, illus. July 1954.

REPTILES AND AMPHIBIANS—Continued

Cagle, Fred R. (Tulane U.) OBSERVATIONS ON THE LIFE CYCLES OF PAINTED TURTLES (GENUS CHRYSEMYS). American Midland Naturalist 52 (1): 225-235, graphs. July 1954.
Size groups and relative abundance in different regions, nest construction, sizes of eggs, numbers of eggs, size of young, growth, size and age at sexual maturity, secondary sex characters, annual activity cycle.

Carpenter, Charles C. (U. Okla.) A STUDY OF AMPHIBIAN MOVEMENT IN THE JACKSON HOLE WILDLIFE PARK. Copeia 1954 (3): 197-200, chart. July 1954.
Rana pretiosa and Bufo boreas. Ranges of individuals were limited. Individuals tended to return toward points of capture.

Carpenter, Charles C. (U. Okla.) WEIGHT-LENGTH RELATIONSHIP OF MICHIGAN GARTER SNAKES. Papers of the Michigan Academy of Science, Arts, and Letters 38: 147-150, graphs. 1952. [1953.]

Cook, Fannye A. (Miss. Game Comm.) SNAKES OF MISSISSIPPI. Mississippi Game & Fish Commission. ii + 40 p., diagram of scutellation. Mimeo. 1954.
Revised version of 1943 publication, "Snakes in Mississippi." The new edition is very similar to the old, but is shorter because of omission of natural history field notes, synonymy, and table of county distribution. Species accounts consist of description, distribution statements (general and Miss.), and notes on habits and habitat.

Eibl-Eibesfeldt, Irenaus. EIN BEITRAGE ZUR PAARUNGSBIOLOGIE DER ERDKRÖTE (BUFO BUFO L.). Behaviour 2 (3): 217-236, 2 figs. 1950.
Adult toads go to the same breeding place every year. The path is found by memory rather than by stimuli from the pond. Copulation occurs on dry land. The receptive female is distinguished by behavior from a male or a spent female. These individuals fight when clasped by a male. Some courtship behavior occurs in autumn.—D. E. Davis.

Eibl-Eibesfeldt, Irenaus. NAHRUNGSERWERB UND BEUTESCHEMA DER ERDKRÖTE (BUFO BUFO L.). Behaviour 4 (1): 1-35. 1951.
A hunting toad restricts its feeding to a territory. Vision is the most important sense for finding prey. Small prey are snapped with tongue but large prey are snapped in the jaws. Acceptance or refusal of prey is due to taste as well as tactile stimuli. Movement of prey is the primary release for the feeding reflex. Experiments with dummies showed that learning is essential for distinguishing palatable from unpalatable food.—D. E. Davis.

Fouquette, M. J., Jr. (U. Texas.) FOOD COMPETITION AMONG FOUR SYMPATRIC SPECIES OF GARTER SNAKES, GENUS THAMNOPHIS. Texas Journal of Science 6 (2): 172-188, graph. June 1954.
Author's summary: "This study represents an attempt to determine food competition among four sympatric species of garter snakes in Texas. The species studied are Thamnophis cyrtopsis, T. marcianus, T. sirtalis, and T. sauritus. The stomachs of 484 museum specimens were examined, of which 114 yielded identifiable food. Some field observations were made, and feeding tests were carried out in the laboratory. It was found that differences existed in the food habits of the four species studied. This is interpreted as a reflection of the difference in habitats which exists among these four garter snakes."

Lowe, Charles H., Jr. (U. Ariz.) NORMAL FIELD MOVEMENTS AND GROWTH RATES OF MARKED REGAL HORNED LIZARDS (PHRYNOSOMA SOLARE). Ecology 35 (3): 420-421. July 1954.

Miller, Malcolm R., and Marilyn E. Robbins. (Stanford U.) THE REPRODUCTIVE CYCLE IN TARICHA TOROSA (TRITURUS TOROSUS). Journal of Experimental Zoology 125 (3): 415-440, graphs, + 3 pls. April 1954.
Detailed, technical account; emphasis on histology.

REPTILES AND AMPHIBIANS--Continued

Moore, J. E., and E. H. Strickland. (U. of Alberta, Edmonton.) NOTES ON THE FOOD OF THREE SPECIES OF ALBERTA AMPHIBIANS. American Midland Naturalist 52 (1): 221-224. July 1954.
Based on analyses of contents of 20 stomachs of Rana pipiens, 37 of Pseudacris nigrita, and 35 of Bufo hemiophrys.

Oelrich, Thomas Mann. THE ANATOMY OF THE HEAD OF CTENOSAURA PECTINATA (IGUANIDAE). Ph.D. thesis, U. Michigan. 295 p. 1954. [From abstract in Dissertation Abstracts 14 (4).]
Apparently an exceptionally thorough study of gross anatomy of both skull and soft parts. Only systems not treated are venous and central nervous systems.

Smith, Roland F. (N. J. Div. Game.) CONTROL OF TURTLES. New Jersey Outdoors 4 (10[sic; should be 11]): 14-15, illus. May 1954.
Describes following methods: shooting, hoop net, fyke net, trot lines, and jug fishing.

FISHES

Applegate, Vernon C., Paul T. Macy, and Virgil E. Harris. SELECTED BIBLIOGRAPHY ON THE APPLICATIONS OF ELECTRICITY IN FISHERY SCIENCE. U. S. Fish and Wildlife Service, Special Scientific Report: Fisheries no. 127. 1-55 p. April 1954.
Part I, the bulk of the paper, lists titles in many languages. Titles pertain to shockers, screens, catching devices, experimental work, etc. Part II lists some unpublished American reports. Part III lists pertinent U. S. patents.

Legendre, Vianney. THE FRESHWATER FISHES. VOLUME I. KEY TO GAME AND COMMERCIAL FISHES OF THE PROVINCE OF QUEBEC. Game & Fisheries Department, Province of Quebec, Montreal. 180 p., illus. 1954. $2.00. (Specify French or English edition.) [From long review by R. R. Miller, Copeia 1954 (3).]
Miller states that the key is well worked out and that the publication has 3 maps and many photographs and drawings.

Scott, W. B. FRESHWATER FISHES OF EASTERN CANADA. University of Toronto Press. 128 p., illus. 1954? $2.50. [From notice in Sport Fishing Institute Bulletin no. 33.]
"For each species, the publication discusses the distinguishing features, size, occurrence, life history and habits, and food. There are black-and-white photographs of most species."

INVERTEBRATES

Abbott, R. Tucker. AMERICAN SEASHELLS. D. Van Nostrand Co., N. Y. 541 p., 23 color pls., 16 monochrome pls., 100 figs. April 1954. $12.50. [From comparative review by J. C. Moore, Everglades Natural History 2 (2).]
Has "the advantage of being useful wherever...one might care to use it in North America north of Mexico. It has the most colored illustrations and the best. Its word descriptions are simply and clearly stated. The information is well arranged so that to find what one wants to know, one does not have to stumble through a mass of irrelevant information. Yet a great deal is there, handy if one wants it. The book begins with 88 pages of stimulating natural history information about the shelled marine animals."

Fichter, Edson. (Idaho St. Coll.) AN ECOLOGICAL STUDY OF INVERTEBRATES OF GRASSLAND AND DECIDUOUS SHRUB SAVANNA IN EASTERN NEBRASKA. American Midland Naturalist 51 (2): 321-439, illus. April 1954.
Long, detailed report. "The study reported here was undertaken in an effort to determine composition and behavior of the communities of invertebrates as they occurred during the period of the investigations, in a 320-acre remnant of unbroken grassland in eastern Nebraska, and in relatively small areas of two postclimaxes within the tract... This paper presents results of the first quantitative ecological study of invertebrates in the true prairie, albeit disturbed by severe drought and in subsere."

INVERTEBRATES—Continued

Johnson, Myrtle E. WEST COAST MARINE SHELLS. San Diego Society of Natural History, Occasional Papers no. 9. 1-36 p., illus. Revised ed., June 1954.
Guide to help high school (or younger) students identify shells and learn something about the animals. Some common species can be determined to species or genus from drawings, photographs, and text. Other species can be identified to their major groups by text material. Several suggestions are made for class activities.

VEGETATION—GENERAL, ECOLOGY, CONTROL, TECHNIQUES

Egler, Frank E. (Amer. Mus. Nat. Hist., N. Y.) PHILOSOPHICAL AND PRACTICAL CONSIDERATIONS OF THE BRAUN-BLANQUET SYSTEM OF PHYTOSOCIOLOGY. Castanea 19 (2): 45-60. June 1954.
A critical analysis intended for those who have some knowledge of the subject. Certain values of the system are granted, but in general Egler considers it the most dangerous single influence in its field.

Moore, P. G. (U. Coll., London, Eng.) SPACING IN PLANT POPULATIONS. Ecology 35 (2): 222-227. April 1954.
Author's summary: "The problem of randomness in plant populations has assumed considerable importance in recent years. This is because so many practical methods of plant sampling assume randomness that it is essential to be able to see whether this assumption is justified or not. Nearly all the previous work on this problem has utilized the methods of quadrat sampling. We have seen here how numerical studies based on the spacing between the plants in a large area can be utilized as an alternative method for investigating randomness. The various theoretical results derived are all fairly simple and are based on well known statistical functions. Further, the fields of application of these results are clearly very wide."

Salisbury, Sir Edward. DOWNS AND DUNES: THEIR PLANT LIFE AND ITS ENVIRONMENT. G. A. Bell & Sons, London. 328 p., illus. 1952. 45s. [From long, informative review by J. S. Olson, Ecology 35 (2).]
The author "has integrated extensive research of his own and former students ...in this comprehensive account of the flora, vegetation and habitats of the English chalk downs, limestone belts and sand dunes." Although written simply enough for "the general reader interested in the countryside" and free from ecological jargon, the book is an important, comprehensive work. It describes vegetation historically and comparatively and explains basic reasons for changes and differences. Soil genesis and chemistry, plant physiology, microclimates, water relationships and other fundamentals are all drawn upon to explain vegetational phenomena.

Whittaker, R. H., Richard B. Walker, and Arthur R. Kruckeberg. (General Electric Co., Richland, Wash.) THE ECOLOGY OF SERPENTINE SOILS. Ecology 35 (2): 258-288, illus. April 1954.
Symposium of 3 papers: Factors Affecting Plant Growth on Serpentine Soils, by Walker. Plant Species in Relation to Serpentine Soils, by Kruckeberg. The Vegetational Response to Serpentine Soils, by Whittaker. The papers report both field and laboratory studies of vegetation and physical and biological factors affecting it. Serpentine soils are widely distributed, are unproductive, and have many endemic plant species. Plants growing on them must tolerate low levels of calcium and major nutrients and high levels of certain minerals. They profit from reduced competition.

Wilde, S. A. (U. Wis.) FLORISTIC ANALYSIS OF GROUND COVER VEGETATION BY A RAPID CHAIN METHOD. Journal of Forestry 52 (7): 499-502. July 1954.

VEGETATION--FLORAS AND COMMUNITIES

Benson, Lyman, and Robert A. Darrow. THE TREES AND SHRUBS OF THE SOUTHWESTERN DESERTS. University of New Mexico Press. 437 p., 84 figs., 34 pls. Second edition 1954. $8.50. [Copy of review in A.I.B.S. Bulletin 4 (3).]

"This is a revision of a work first published in 1945 by the University of Arizona under title of 'A Manual of Southwestern Desert Trees and Shrubs.' One of a series on the flora of Arizona and the southwest it is designed as a semi-technical manual for identification of the woody plants of the southwestern United States. Introductory remarks and an exposition of general taxonomic principles comprise the first forty-four pages. Keys to and descriptions of forty-three families of woody plants represented in the southwestern flora make up the bulk of the text. Particular mention should be made of the colored photographs and of the handsome line drawings by Lucretia Breazeale Hamilton."

Daubenmire, Rexford. (Dept. Botany, Wash. St. Coll.) NOTES ON THE VEGETATION OF FORESTED REGIONS OF THE FAR NORTHERN ROCKIES AND ALASKA. Northwest Science 27 (4): 125-138. Nov. 1953.

Describes forests of well-drained uplands, forests characteristic of cold wet soils, upper timberlines, vegetation about freshwater ponds, vegetation about a saline pond, frost hollow vegetation, grasslands, and vegetation of the seaward slope near Haines, Alaska.--Neil Hotchkiss.

Dittmer, Howard J., Edward F. Castetter, and Ora M. Clark. THE FERNS AND FERN ALLIES OF NEW MEXICO. University of New Mexico Press. 139 p., 55 figs. 1954. $1.00. [Copy of review in A.I.B.S. Bulletin 4 (3).]

"This little manual should be a valuable addition to the library of anyone interested in the flora of the southwest. Listed in the manual are 7 families, 24 genera, and 75 species and varieties of ferns and fern allies. Each species is described fully and many are illustrated by full page plates of line drawings by Jeanne R. Janish."

Jennings, O. E., and Andrey Avinoff (illustrator). WILD FLOWERS OF WESTERN PENNSYLVANIA AND THE UPPER OHIO BASIN. University of Pittsburgh Press. Vol. 1, lxxv + 574 p., 150 maps. Vol. 2, xvi + 200 pls. with descriptions on facing pages. 1953. $60, which is said to be about half of cost. Edition limited to 3,000 sets. [From long review by Howard Zahniser, Nature Magazine 47 (6).]

Extremely high quality of production throughout make this set a collector's item. The 200 watercolor reproductions are considered excellent. The text is said to contain "accurate information for about 2200 species, including family and genera, ecology, national and international distribution, keys, and descriptions which help identify the plants... About 75 introductory pages cover soils, climate, physiographic and topographic history, geology, plant geography, the historic development of botany in the region, a glossary, a gazetteer, a list of collectors and authorities, a systematic list of plant families, a key, and a bibliography."

Koch, Leo Francis. (Bakersfield Coll.) DISTRIBUTION OF CALIFORNIA MOSSES. American Midland Naturalist 51 (2): 515-538, maps. April 1954.

Study of phytogeography and origins of flora.

Parker, Johnson. (U. Idaho.) ENVIRONMENT AND VEGETATION OF TOMER'S BUTTE IN THE FOREST-GRASSLAND TRANSITION ZONE OF NORTH IDAHO. American Midland Naturalist 51 (2): 539-552, illus. April 1954.

Discussion of factors that produced present vegetation.

Rogers, C. M. (Wayne U.) THE VEGETATION OF THE MESA DE MAYA REGION OF COLORADO, NEW MEXICO, AND OKLAHOMA. Lloydia 16 (4): 257-290, illus. Dec. 1953 [May 1954].

Describes geology and plant communities of this long, narrow mesa and lists its plants, with indication of abundance of each species in each community.

VEGETATION--FOREST

Abbott, Richard W. (U. Wis.) WOODLAND PASTURING--ARE WE GOING FAST ENOUGH? Journal of Forestry 52 (6): 431-433. June 1954.
Figures show that grazing of woodlots is being reduced all too slowly, with 62% of farm woodlots in central and northern U. S. still being pastured in 1949, as compared with 73% in 1924. The author suggests studies that would give figures needed to persuade farmers, and suggests ways of getting the message to farmers.

Author? FOREST INVENTORY STATISTICS FOR JACKSON COUNTY, ALABAMA. TVA, Norris, Tenn., For. Bul. no. 30. 12 p., mimeo. 1953. [From Journal of Forestry 52 (8).]

Bourdeau, Philippe. (N. C. St. Coll.) OAK SEEDLING ECOLOGY DETERMINING SEGREGATION OF SPECIES IN PIEDMONT OAK-HICKORY FORESTS. Ecological Monographs 24 (3): 297-320, illus. July 1954.

Daubenmire, Rexford. (Dept. Botany, Wash. St. Coll.) CLASSIFICATION OF THE CONIFER FORESTS OF EASTERN WASHINGTON AND NORTHERN IDAHO. Northwest Science 27 (1): 17-24. Feb. 1953.
Describes tree unions and subordinate vascular unions and has a key for identifying the conifer forest associations.--Neil Hotchkiss.

Deam, Charles C., with assistance of Thomas E. Shaw. TREES OF INDIANA. Indiana Department of Conservation, Publication 13A. Bookwalter Co. 330 p., illus. Third revised ed. 1953. Price not stated. [From Monthly Checklist of State Publications, April 1954.]

Eyre, F. H., chairman. REPORT OF COMMITTEE ON FOREST TYPES. Society of American Foresters, Wash. 6, D. C. 67 p. 1954. $1.00. [From review by W. D. Miller, Journal of Forestry 52 (7).]
"This bulletin, the culmination of a quarter-century of work by many foresters, gives clear, concise, and adequate description of 156 forest types of the United States, Canada, and Alaska... The type descriptions cover composition, occurrence, site conditions, successional relations, transition forms, and variants." Classifications of U. S. and Canadian foresters are compared. A "reliable, indispensable, and interesting publication."

Hughes, Katherine W., compiler. FORESTRY THESES ACCEPTED BY COLLEGES AND UNIVERSITIES IN THE UNITED STATES, 1900-1952. Director of Publications, Oregon State College. 140 p. 1953. $1.00. [From review by Henry Clepper, Journal of Forestry 52 (7).]
Lists 2638 theses; these are arranged by schools and indexed by subject.

Little, Elbert L., Jr., and Keith W. Dorman. SLASH PINE (PINUS ELLIOTTII), INCLUDING SOUTH FLORIDA SLASH PINE, NOMENCLATURE AND DESCRIPTION. U. S. Forest Service, Southeastern Forest Experiment Station (Asheville, N. C.), Station Paper no. 36. 11 + 82 p., illus. April 1954.
Full, well illustrated analysis of this important group of pines. This monograph will, it is hoped, end a great deal of confusion and contradiction. Many characters are considered and taxonomic history is discussed. P. caribaea is excluded from the U. S. flora. P. elliottii var. elliottii is the name of the slash pine widely distributed in the Southeast. P. elliottii var. densa is restricted to South Florida and central coastal parts of Florida. P. palustris is the name recommended for longleaf pine.

Little, S., and E. B. Moore. SEVERE BURNING TREATMENT TESTED ON LOWLAND PINE SITES. U. S. Forest Service, Northeastern Forest Experiment Station (Upper Darby, Pa.), Station Paper no. 64. 11 p. 1953. [From Journal of Forestry 52 (5).]

VEGETATION--FOREST--Continued

Lutz, H. J. THE EFFECTS OF FOREST FIRES ON THE VEGETATION OF INTERIOR ALASKA. Alaska Forest Research Center (Juneau), Station Paper no. 1. 36 p., illus. 1953. [From Journal of Forestry 52 (5).]

McCormack, James F. FOREST STATISTICS FOR NORTH CENTRAL AND NORTH GEORGIA. U. S. Forest Service, Southeastern Forest Experiment Station (Asheville, N. C.), Forest Survey Release no. 42. ii + 31 p., illus. July 1954.
Area of commercial forest land has increased by 1.2 million acres since 1936. Pine has been cut faster than it has grown. Area in hardwoods has increased, chiefly because heavy selection for pine permitted hardwoods to take over.

Merkle, John. (Texas A & M Coll.) AN ANALYSIS OF THE SPRUCE-FIR COMMUNITY ON THE KAIBAB PLATEAU, ARIZONA. Ecology 35 (3): 316-322, illus. July 1954.
A study in plant ecology, with brief account of effect of large deer population, past and present.

Minnesota. THE FOREST RESOURCE OF LAKE OF THE WOODS COUNTY. Office of Iron Range Resources and Rehabilitation, 624 State Office Building, St. Paul 1, Minn. 1-61 p., illus. 1954?
Detailed report that discusses past and present conditions and makes recommendations for future. Similar reports are now available for 9 other counties in region.

Moravets, F. L. FOREST STATISTICS FOR CROOK COUNTY, OREGON. U. S. Forest Service, Pacific Northwest Forest and Range Experiment Station (Portland, Ore.), Forest Survey Report no. 114. ii + 22 p., map and graphs. May 1954.

Moravets, F. L. FOREST STATISTICS FOR JEFFERSON COUNTY, OREGON. U. S. Forest Service, Pacific Northwest Forest and Range Experiment Station (Portland, Ore.), Forest Survey Report no. 115. iii + 23 p., map. June 1954.

Nichols, J. Milford. DIRECT SEEDING OF OAK IN MISSOURI. Agricultural Experiment Station (Columbia, Mo.), Bulletin 609. 4 p. 1954. [From Monthly Checklist of State Publications 45 (6).]

Preston, Richard J., Jr. NORTH AMERICAN TREES. Iowa State College Press. 428 p., illus. New edition, 1954. $3.00. [From Journal of Range Management 7 (3).]
Of the 1948 edition (426 p.), Neil Hotchkiss wrote (in WR 55: 47): "Keys, descriptions, drawings, and range maps combine to make this a usable field manual. It includes 568 species, omitting only hawthorns and shrubby willows."

VEGETATION--PASTURE AND RANGE

Anthony, Margery. (Chico St. Coll.) ECOLOGY OF THE OPUNTIAE IN THE BIG BEND REGION OF TEXAS. Ecology 35 (3): 334-347, illus. July 1954.
Interestingly written account. Contains a few observations on interrelationships of cacti with wild mammals and livestock.

Kelting, Ralph W. (U. Tulsa.) EFFECTS OF MODERATE GRAZING ON THE COMPOSITION AND PLANT PRODUCTION OF A NATIVE TALL-GRASS PRAIRIE IN CENTRAL OKLAHOMA. Ecology 35 (2): 200-207, graphs. April 1954.

Lodge, Robert W. (Exp. Sta., Swift Current, Sask.) EFFECTS OF GRAZING ON THE SOILS AND FORAGE OF MIXED PRAIRIE IN SOUTHWESTERN SASKATCHEWAN. Journal of Range Management 7 (4): 166-170. July 1954.
Portion of summary: "Forage analyses showed that ether extract, crude fiber and ash were higher and protein, nitrogen-free-extract, calcium and phosphorus were lower on the ungrazed treatments as compared to the grazed areas in all classes of forage. Differences in protein between grazed and ungrazed treatments were most significant."

VEGETATION—PASTURE AND RANGE—Continued

Many authors. PROCEEDINGS OF THE SIXTH INTERNATIONAL GRASSLAND CONGRESS, PENNSYLVANIA STATE COLLEGE, AUG. 17-23, 1952. 2 vols. vi + 938 and 941-1801 p. [1953?] $15.00 from International Grassland Congress, 1778 Pa. Ave., Wash. 25, D. C.

An encyclopedic work containing numerous technical papers by workers from many countries. Some of the major sections, each of which consists of several to many articles, are: Genetics and breeding; Improvement and management of pastures, meadows, and turf; Improvement and management of range lands; Ecology and physiology of grasslands; Soil management and fertilization; Seed production and distribution; Soil and water conservation; Harvesting and preservation of forage; Use of forage in livestock feeding; Machinery; Experimental procedure in grassland research; Improvement and management of tropical grasslands.

Moyer, John Frederick. ECOLOGY OF NATIVE PRAIRIE IN IOWA. Ph.D. thesis, Iowa State College. 1953. [From long abstract in Iowa State College Journal of Science 28 (3).]

Study of soils and vegetation in 2 quarter-section tracts of native prairie in northern Iowa. These tracts were purchased by the State Conservation Commission.

Robertson, Jos. H., and P. B. Kennedy. (U. Nev.) HALF-CENTURY CHANGES ON NORTHERN NEVADA RANGES. Journal of Range Management 7 (3): 117-121, illus. May 1954.

Surveys of range conditions in several areas were made in 1902 and again in 1952. Changes are described. Desirable plants are fewer and erosion is worse.

Weaver, J. E., and W. E. Bruner. (U. Nebr.) NATURE AND PLACE OF TRANSITION FROM TRUE PRAIRIE TO MIXED PRAIRIE. Ecology 35 (2): 117-126, maps. April 1954.

VEGETATION—WET-LAND

Allen, G. O. (Godalming, Surrey, Eng.) AN ANNOTATED KEY TO THE NITELLEAE OF NORTH AMERICA. Bulletin of the Torrey Botanical Club 81 (1): 35-60. Jan.-Feb. 1954.

34 species of Nitella and 8 species of Tolypella.—Neil Hotchkiss.

Löve, Áskell and Doris. (Dept. Botany, Univ. Manitoba, Winnipeg.) VEGETATION OF A PRAIRIE MARSH. Bulletin of the Torrey Botanical Club 81 (1): 16-34. Jan.-Feb. 1954.

At Delta, south end of Lake Manitoba. The principal plants are phragmites, scolochloa, and hardstem bulrush.—Neil Hotchkiss.

Monson, Paul Herman. MARSH AND AQUATIC DICOTYLEDONOUS FLORA OF IOWA. M.S. thesis, Iowa State College. 1953? [From Iowa State College Journal of Science 28 (3).]

Moss, E. H. (U. of Alberta, Edmonton). MARSH AND BOG VEGETATION IN NORTHWESTERN ALBERTA. Canadian Journal of Botany 31 (4): 448-470, illus. July 1953.

Describes swamp, marsh, wet meadow, saline meadow, Drepanocladus bog, Sphagnum bog, and the successions that involve them. Discusses retrogression caused by burning, permafrost areas, and phytogeographical features.—Neil Hotchkiss.

GENERAL CONSERVATION, WATER, AND CLIMATE

Craig, James B. MUSKINGUM REVISITED. American Forests 60 (6): 8-13, 36, 38-39, illus. June 1954.

Story of the famous and successful Muskingum project in Ohio, in which a watershed has been intelligently and profitably managed for best use and conservation of its soil and water resources.

Currie, B. W. (U. Saskatchewan.) CLIMATIC TRENDS ON THE CANADIAN PRAIRIES. Agr. Inst. Rev. 9 (1): 21-23. Jan.-Feb. 1954. [From Journal of Range Management 7 (4).]

GENERAL CONSERVATION, WATER, AND CLIMATE--Continued

Huffman, Roy E. IRRIGATION DEVELOPMENT AND PUBLIC WATER POLICY. Ronald Press Co., N. Y. 336 p., illus. 1953. $6.50. [From review by E. J. Dyksterhuis, Ecology 35 (3).]

"The kind of book from which ecologists can obtain an objective and well-rounded viewpoint on this extremely important type of land use--in its relation to other land uses; particularly forest, range, wildlife, and watershed uses... Professor Huffman has not dodged controversial issues; and there are many in his subject. His appraisals of them appear fair to this reviewer... Ecologists will find discussions of many topics of special interest to them that would scarcely be expected from the title or the preceding summary... The author's background in economics and resource planning as well as his current activities with the Missouri Basin Regional Research Committee, and the Missouri Basin Survey Commission qualify him to deal authoritatively with his subject."

Johnson, V. Webster, and Raleigh Barlowe. LAND PROBLEMS AND POLICIES. McGraw-Hill Book Co., N. Y. 422 p. 1954. $6.50. [From review by J. G. Yoho, Journal of Forestry 52 (5).]

"...basically an economics book. In it the land problems and policies of the United States are analyzed economically." The authors "employ only the minimum of economic theory which makes the book easier reading for a person not trained in economics. ...several chapters are devoted to developing the legal framework which forms the basis for present and possible future U. S. land policy... There are included discussions on taxation, rural zoning, subsidies, soil conservation districts, grazing districts, and others... Most of the examples deal with the economics of soil conservation... Past trends in the pattern of land use are pointed out and then projected into the future on the basis of population predictions..."

Leopold, Luna B., and Thomas Maddock, Jr. THE FLOOD CONTROL CONTROVERSY / BIG DAMS, LITTLE DAMS, AND LAND MANAGEMENT. Ronald Press, N. Y. 1954. $5.00. [From review by Stanley A. Cain, Journal of Soil and Water Conservation 9 (3).]

"This is the most important book yet in the flood control field, and...it may well be the most important book yet in conservation and resource management." It analyzes the headwater management methods of the USDA and the mainstream dam approach of the Army Engineers. "But it is not a polemic. It does not plead either case. It provides the available facts. It is shown that the program of neither agency is adequate alone, that upstream and downstream works are not interchangeable for they serve different purposes... In the dozen or more chapters one finds the data one needs, in so far as they exist, about hydrology, engineering, soil and crop practices, the economics involved, agency policies and administrative problems, the needs of people, and the facts of politics." The volume is the result of a project of the Conservation Foundation.

North Central Farm Management Research Committee. ECONOMICS OF SOME SOIL CONSERVATION PRACTICES. North Central Regional Publication no. 44. Iowa Agricultural Experiment Station (Ames) Research Bulletin 403. Dec. 1953. [From review by W. H. Heneberry, Journal of Soil and Water Conservation 9 (3).]

"...a store of information on costs and benefits of contouring, terracing, grass waterways, strip cropping, mulch tillage, drainage, and irrigation." Experimental results from several states are reported and are related to specific conditions.

Peterson, Elmer T. (Oklahoma City.) TALL DAMS AND SOIL SOUP. The Land 8 (1): 19-26, illus. Review of spring 1954.

More facts and figures, forcefully presented, on the great merits of small watershed management with its accompanying soil and water conservation, and the drawbacks of big dams. Peterson makes a strong case.

GENERAL CONSERVATION, WATER, AND CLIMATE--Continued

Woytinsky, W. S. and E. S. WORLD POPULATION AND PRODUCTION. Twentieth Century Fund, N. Y. 1268 p., illus. 1953. $12.00. [From review by L. G. Hines, Journal of Soil and Water Conservation 9 (3).]

"This prodigious study is an attempt to survey the needs and resources of the whole world and to discover significant trends in the pattern of the present era's economic activity... The first section...contains a detailed survey of the growth, distribution, and composition of world population... World Needs and Resources are considered in the second section of the study along with such related topics as national income, consumption standards, human resources, national per capita income variations, and the like... Excellent material is included in this section on the comparative position of agriculture in different parts of the world, food crops, livestock, and animal products, together with an appraisal of the related renewable output of forests and fisheries." Other sections survey mineral resources and industries. "...this book is a very notable contribution."

SOILS

Bacon, S. R., and others. SOIL SURVEY OF CRAWFORD COUNTY, PENNSYLVANIA. U. S. Soil Conservation Service, Series 1939, no. 18. 1-77 p., illus. + large folding maps. April 1954. Price not stated. Order from Superintendent of Documents.

A modern soil survey report is one of the best sources of information about an area. Soils are emphasized, of course, but much knowledge of topography, geology, agriculture, and vegetation can also be gained. Maps that accompany these reports are large, colored, and exceedingly detailed. They are usually somewhat out of date for cultural features, but otherwise are among the best and largest scale maps that can be found.

Leighty, Ralph G., and others. SOIL SURVEY (DETAILED-RECONNAISSANCE) OF COLLIER COUNTY, FLORIDA. U. S. Soil Conservation Service, Series 1942, no. 8. 1-72 p., illus. + large folding maps. March 1954. Price not stated. Order from Superintendent of Documents.

Perry, H. H., and others. SOIL SURVEY OF WISE COUNTY, VIRGINIA. U. S. Soil Conservation Service, Series 1940, no. 12. 1-114 p., illus. + large folding maps. May 1954. Price not stated. Order from Superintendent of Documents.

Shrader, W. D., and others. SOIL SURVEY OF JASPER COUNTY, MISSOURI. U. S. Soil Conservation Service, Series 1942, no. 5. 1-67 p., illus. + large folding map. March 1954. $1.25 from Superintendent of Documents.

Soine, Olaf C., and P. R. McMiller. SOIL SURVEY (SEMIDETAILED) OF LE SUEUR COUNTY, MINNESOTA. U. S. Soil Conservation Service, Series 1944, no. 3. 1-55 p., illus. + large folding maps. April 1954. Price not stated. Order from Superintendent of Documents.

Suman, Reynold F., and R. L. Carter. BURNING AND GRAZING HAVE LITTLE EFFECT ON CHEMICAL PROPERTIES OF COASTAL PLAIN SOILS. U. S. Forest Service, Southeastern Forest Experiment Station (Asheville, N. C.), Research Notes no. 56. 2 p. July 1954.

Based on work with relatively infertile, sandy soils near Tifton, Ga. Soil samples were taken 8 years after treatments were initiated. [Probably the area had been burned repeatedly in earlier times.] "Since little or no change occurred in soil organic matter, phosphate, potash or acidity, indications are that burning and grazing do not appreciably influence timber or other vegetative growth on these soils."

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